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WORKING PLAN

FOR THE

VELLORE EAST FOREST DIVISION MADRAS

(1936-37 TO 1945-46)

BY

A. R. BRAND, M.F.S.,
Assistant Conservator of Forests

Under the direction of the Conservator of Forests, Working Plans Circle

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WORKING PLAN FOR THE VELLORE EAST FOREST DIVISION

PART I.

Summary of facts on which the proposals are based.

CHAPTER I.—THE TRACT DEALT WITH.

SECTION 1.—NAME AND SITUATION.

1. *Name.*—This working plan deals with the reserved forests of the Vellore East forest division, which are still under the control of the forest department, and will be known as the Vellore East Working Plan.

2. *Situation.*—The Vellore East forest division was constituted a separate unit in December 1932 as a result of the bifurcation of the then Vellore forest division. The tract falls between latitudes N. 11° 59′ and 13° 2′ and longitudes E. 78° 39′ and 80° 20′. It extends along the east coast from the Kottalaiyar river in the north to the Ponniar river in the south, and inland as far as Vaniyambadi on the Madras and Southern Mahratta Railway.

3. *Area.*—The division is 6,748 square miles in extent and comprises twenty revenue taluks, a list of which is given in Appendix I.

4. The area of the reserved forests still under forest department control is 467 square miles. These reserves are situated along the western boundary of the division and are for the most part adjacent to the forests of the neighbouring Vellore West division. Details relating to their area and distribution are given in paragraphs 25 and 32 below.

SECTION 2.—CONFIGURATION OF THE GROUND.

5. *Altitude and topography.*—The tract shows great variation in altitude and configuration. For the purpose of description it may be classified under three heads, viz., The Javadi and Kalroyan hills, the plains and the Palar river margins.

6. *The Javadi Hills.*—These hills monopolise by far the greater part of the area and run approximately north and south between the Vellore-Bangalore and Vellore-Cuddalore roads. They attain a maximum length of about 40 miles and a maximum width of about 16 miles. The outer slopes are steep, rocky and often precipitous. The centre and south of the range, also extending into the neighbouring Vellore West division, consist of extensive undulating plateaux with large valleys cutting across them and interspersed by occasional peaks. In the north the ground is broken up into a series of hills and valleys, a few small plateaux occurring on the hill tops. The average height above mean sea level is approximately 2,500 feet. The highest point in the Vellore East division is Puliyankuppam Malai, 3,535 feet, in the Santavasal range.

7. *The Kalroyan Hills.*—Similar in formation to the Javadis, the Kalroyans form a small isolated range about 14 miles long and 6 miles wide in the extreme south of the division. The average height above mean sea level is approximately 2,000 feet. The highest point, Valasamalai, 3,395 feet, marks the summit of a plateaux some 1,500 acres in extent.

8. *Plains.*—These comprise the more or less flat stretches extending from the foot of the hills to the limits of the cultivation and other private holdings in the valleys and low lying country. The height above mean sea level varies from 750 feet in the south of the division to 1,250 feet in the north.

9. *Palar river margins.*—Only 1,351·25 acres of river margin fall within the scope of this plan. The area comprises seven plantations situated on the flat sandy banks of the Palar river. The elevation above mean sea level varies from about 540 feet to 780 feet.

10. *Drainage.*—The country slopes mainly from west to east and is drained by the Palar river in the north and the Ponniar in the south. Rivers of secondary importance are the Punniyathirtha Nadi, flowing into the Palar near Pallikonda, and the Cheyyar near Polur with its feeders the Thellai and the Padavettar.

SECTION 3.—GEOLOGY, ROCK AND SOIL.

11. *Sub-soil.*—The under-lying rock is mostly granitic gneiss in various stages of disintegration, with frequent, sometimes extensive, outcrops of granite.

12. *Surface soil.*—The soil varies from a hard and stony type on the hill sides, where disintegrated quartz predominates, to a fertile red clayey loam on the plateaux and in the valleys. In the former case little or no forest growth exists, while in the latter, the depth of soil is capable of supporting reasonably good tree growth.

13. *Humus.*—The soil is strikingly devoid of humus. The little leaf mould which is formed each year crumbles into powder in the dry season and, owing to the steepness of the country, a usually very open canopy and the scarcity, and often complete absence, of protective undergrowth, is carried away by the pre-monsoon showers in April and May.

14. Remains of experimental excavations and borings for pyrites are to be found in the Pariamalai reserve of the Polur range, where an area of 3·53 square miles was leased for a period of one year from the 2nd of March 1928, for the purpose of prospecting. The experiment seems to have been a failure.

SECTION 4.—CLIMATE.

15. *General.*—The climate of the Javadis is particularly favourable to the growth of sandalwood, combining as it does comparative coolness with plenty of sunshine and a very fair rainfall, the latter however never being sufficient to set up a waterlogged condition of the soil, so unfavourable for the development of this species. The Kalroyan hills enjoy a similar climate.

16. The plains and the foot of the hills are hot and dry. During the months of November, December and January the weather becomes, pleasant but never cold.

17. *Winds.*—The division is subject to the usual monsoon winds, but these are generally not strong enough to cause damage to forest growth.

18. *Rainfall.*—There are six rain gauge stations in the division ; a seventh, Kylasagiri, having been abolished in 1933. The average monthly rainfall recorded at each station over a period of ten years, 1925 to 1934, is given in the following statement.

Statement showing the average monthly rainfall at each rain-gauge station, Vellore East Division.

Name of station.	Average rainfall in inches.												
	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sep.	Oct.	Nov.	Dec.	Total.
					Odagathur range.								
Naikaneri ..	1·13	0·45	0·16	1·04	4·79	2·04	2·87	4·08	5·13	7·54	4·29	3·29	36·81
Kylasagiri ..	0·40	0·99	0·28	0·69	0·66	0·91	1·09	1·80	3·20	4·06	4·40	1·60	20·08*
					Santavasal range.								
Amerdi	3·71	1·92	0·72	1·01	3·42	2·21	3·60	2·87	5·90	8·57	6·40	2·49	42·82
Shenbakatope ..	2·80	1·47	0·84	1·80	3·74	2·79	3·18	3·88	5·38	8·28	6·14	3·97	44·27
						Polur range.							
Patrakad ..	1·58	2·44	0·48	1·57	4·54	1·66	2·99	5·09	5·92	10·19	6·66	4·57	47·69
Komattiyur ..	1·70	1·28	0·94	1·21	4·36	3·46	3·19	5·90	4·28	10·97	5·72	1·94	44·95
Molakado ..	1·22	1·01	0·50	1·26	2·08	1·27	2·00	2·36	4·87	7·57	5·03	2·45	31·62
Average for the division.	**1·79**	**1·37**	**0·56**	**1·23**	**7·23**	**2·05**	**2·70**	**3·71**	**4·95**	**8·17**	**5·52**	**2·90**	**38·32**

* The figures for Kylasagiri are the averages for seven years only, 1926 to 1932.

19. It will be seen from the foregoing statement that the division gets the benefit of both the north-east and south-west monsoons and that the rainfall is distributed throughout the year, the heaviest falls occurring in the months of May and October. The figures should however be treated with caution as they are recorded by forest guards and may not be accurate. The monthly rainfall statements for each year during the period 1925 to 1934 are to be found in Appendix II.

20. *Malaria.*—The forests of the division have an evil reputation for malaria, particularly during the period January to June. The camps on the Javadis plateau are worse than others. There is in some quarters a feeling that this reputation is exaggerated, but judging by the health of the subordinates employed on enumeration and stock-mapping in connection with this plan, it would seem that it is fully justified.

SECTION 5.—WATER-SUPPLY.

21. Water-supply to all subordinates quarters and rest houses is entirely from wells and is generally satisfactory. The usual sources of supply to the villages in the enclosures are tanks and wells. The rivers and streams, with the exception of the Ponniar in the south of the division, carry water only for a few days after rain has fallen.

22. In addition to a well, Amerdi, in the Santavasal range, also has a plentiful supply of spring water rising in several places along the banks of the Amerdi river.

23. Tube wells were put in at Komattiyur and Mandapare in 1919 at costs of Rs. 1,400 and Rs. 1,340 respectively. They were intended primarily to supply the forest rest houses at these two places, but they also serve to supplement an indifferent supply from ordinary wells in the neighbouring villages. The Komattiyur tube well is still functioning satisfactorily while that at Mandapare broke down some years ago. It is however believed that the latter can be set right at a comparatively small cost.

24. The question of water facilities in grazing grounds needs attention. The sources of supply are wells and tanks, and a large number of these, about thirty-five, require improvement or repair. The probable cost will be approximately Rs. 2,780. The question is dealt with in Part II under 'Subsidiary Measures for Improvement' in the Grazing Working Circle.

SECTION 6.—DISTRIBUTION OF THE AREA.

25. The headquarters of the division is Vellore. The 467 square miles of reserved forest is distributed among the four ranges as follows :—

Range.	Headquarters.	Area of reserves in square miles.
Odagathur.	Odagathur.	166·8
Santahvasal.	Santhavasal	110·5
Polur.	Polur.	111·4
Tiruvannamalai.	Tiruvannamalai.	78·3

The present area of each reserve is given in column 12 of the statement at paragraph 32 below.

26. At the time of writing steps are being taken to bifurcate the Odagathur range into two units as under :—

Range.	Headquarters.	Area of reserves in square miles.
Vellore.	Vellore.	56·4
Odagathur	Odagathur.	110·4

27. The names and areas of the beats into which each range is divided are given in the following statement. Details of headquarters and staff are also shown :—

Serial number and name.	Area in acres.	Headquarters.	Staff. Guards.	Staff. Watchers.	Staff. Foresters.
(1)	(2)	(3)	(4)	(5)	(6)
		Odagathur Range.			
1 Vellakkal (South)	5037	Vellakuttai	1	1	1 (beats 1–6)
2 Vellakkal (North)	5453*	Pachakuppam	1	1	
3 Panangatteri	4550*	Panangatteri	1	1	
4 Ambur	4294	Ambur	1	1	
5 Naickaneri	6944*	Naikaneri	1	1	
6 Tottalam	6189*	Tottalam	1	1	
7 Pakkam	5351	Gollkottai	1	1	1 (beats 7–9)
8 Kallaparai	7,571	Kallaparai	1	1	
9 Asanampet	8,557	Asanampet	1	1	
10 Palur	3,437	Tirumalaikuppam ..	1	1	1 (beats 10–13)
11 Agaram	4,454	Krishnarajapalayam ..	1	1	
12 Odagathur	3,571	Odagathur	1	1	
13 Arasampet	6,227*	Kottavur	1	1	
14 Anaikattu	3,232	Anaikattu	1	1	1 (beats 14–18)
15 Pinnatturai	5,382*	Kilkottur	1	1	
16 Alleri	5,632*	Gudisai	1	1	
17 Athiyur	3,002*	Govindareddipalayam ..	1	1	
18 Usoor	2,534	Usoor	1	1	
19 Sholavaram	2,650*	Sholavaram	1	1	1 (beats 19–21)
20 Thellai	4,154*	Kinnikulam	1	1	
21 Erimodu	6,649*	Erimodu	1	1	
22 Virinjipuram and Vikramachi	387	Virinjipuram	1	1	1 at Vellore. (beats 22–28)
23 Chennur	130	Chennur	..	1	
24 Ammundy	163	Tirumani	..	1	
25 Kilminal	150	Puttutakku	..	1	
26 Tiruvalam	464	Tiruvalam	1	1	
27 Vannivedu	57	Vannivedu	..	1	
28 Banavaram	1,065	Banavaram	..	1	

Note.—If the bifurcation of Odagathur range materializes beats 1 to 13 will go to the proposed Odagathur range and 14 to 28 to the proposed Vellore range.

* The areas of these beats include the areas of enclosures situated in them. Thus the total area of all the beats will not agree with the total area of the reserves.

Serial number and name.	Area in acres.	Headquarters.	Staff. Guards.	Staff. Watchers.	Staff. Foresters.
(1)	(2)	(3)	(4)	(5)	(6)
		Santavasal Range.			
1 Yeriyur	8,467	Serpady	1	1	
2 Thongamalai	12,806 *	Thongamalai	1	1	1
3 Thongamalai (Sandal)		Do.	1	1	
4 Amerdi	17,158*	Amerdi	1	1	
5 Amerdi (Sandal)		Do.	1	1	
6 Attuparai	6,374	Attuparai	1	1	1
7 Nadanur	23,526*	Nadanur	1	1	
8 Nadanur (Sandal)		Do.	1	1	
9 Santavasal	4,902	Santavasal	1	1	1
10 Athuvambady	6,771*	Athuvambady	1	1	
11 Karnatigiri	7,270*	Potharai	1	1	
		Polur Range.			
1 Burgur	16,826*	Burgur	1	1	1
2 Burgur (Sandal)		Do.	1	1	
3 Komattiyur	15,546*	Komattiyur	1	1	1
4 Komattiyur (Sandal)		Do.	1	1	
5 Koilur	5,888*	Koilur	1	1	
6 Patrakad	14,810*	Patrakad	1	1	1
7 Patrakad (Sandal)		Do.	1	1	
8 Moolakad (North)	8,621*	Nawabpalayam	1	1	
9 Periamalai	6,970	Athimoor	1	1	1
10 Moolakad (South)	10,803*	Melsholankuppam	1	1	
		Tiruvannamalai Range.			
1 Tandrampet	5,440*	Tandrampet	1	1	
2 Tanipady	6,592*	Tanipady	1	1	
3 Reddipalayam	6,048	Reddipalayam	1	1	
4 Veppur Chekkady	9,933	Veppur Chekkady	1	1	1
5 Bhimarapatti	7,626*	Bhimarapatti	1	1	
6 Attipady	5,194*	Attipady	1	1	
7 Perungolathur Swamymalai.	6,089	Navakottai	1	1	
8 Pavunjipattu	4,314	Pavunjipattu	1	1	

* The areas of these beats include the areas of enclosures situated in them. Thus the total area of all the beats will not agree with the total area of the reserves.

SECTION 7.—STATE OF BOUNDARIES.

28. *General.*—The reserve and enclosure, or internal, boundaries are demarcated by cleared lines 12 to 18 feet wide. Angles and intermediate points are marked either by white washed stone pillars, 4 to 6 feet high, bearing arrow marks and the letters 'R.F.', or stone cairns surmounted by granite slabs similarly marked.

29. *Enclosure boundaries on the Javadis.*—The confused state of the enclosure boundaries on the Javadis requires emphasis. In 1888 during the forest settlement of these hills, certain areas within the reserves were excluded from reservation and ordered to be retained as enclosures but were not then demarcated. In 1900 these enclosures were surveyed by the Revenue Survey Department, and it was then found that the area actually cultivated was in excess of that originally set apart for enclosures.

30. In 1907 Government sanctioned the issue of 'ryotwari' pattas for all lands held under 'Sivoy-jama' (cultivation without the grant of patta), but not admitted at settlement. In the same year Government also ordered that such areas, together with sufficient margin for extension of cultivation and exercise of communal privileges, should be excluded from the reserves and disafforested. Accordingly, in 1913 an area of about 40 square miles was disafforested. The distribution of this area in the various reserves is to be found in column 6 of the statement in paragraph 32 below.

31. Investigations carried out by the working plans staff in the Polur range indicate that the disafforestations have not been posted either in the village records or in the 4-inch Survey of India sheets. The result is that the lines cleared on the ground, those shown in the village records and those on the 4-inch Survey of India sheets, which are the standard working maps for the division, all differ. It is probable that the same state of affairs exists in many parts of the division. Verification of boundary lines is thus an immediate necessity. Since the submission of the reconnaissance report in connection with this plan, this necessity has been realized and an Extra Assistant Conservator has been posted to the division to investigate and set matters right.

SECTION 8.—LEGAL POSITION.

32. *Reserves.*—The reserved forests of the division are the absolute property of the State. The numbers and dates of the Section 16 Notifications relating to the various reserves are given in the following statement, which also shows the disafforestations effected from time to time.

Statement of Reserves, Vellore East Division.

No. (1)	Reserve. (2)	Original settlement — Area. (3) Acs.	Section 16 Notification — No. (4)	Section 16 Notification — Date. (5)	Disafforestations — Area. (6) Acs.	Section 24 Notification — No. (7)	Section 24 Notification — Date. (8)	Transferred elsewhere — Area. (9) Acs.	Authority — No. (10)	Authority — Date. (11)	Present area. (12)	Remarks. (13)
	Odagathur Range.											
1	Ambur	27,878·40	251	5th May 1893	1,209·73	G.O. 1370	10th May 1913					Enc. Nos. 93, 94 and 95.
					14·66	G.O. 748	1st April 1916					....
					144·01	260	18th February 1922					
		6·83	337	17th October 1922								....
					8·48							
					175·00	388	17th December 1930				26,333·35	As per erratum to Notification No. 260/18th February 1922
2	Ambur Fuel	5,452·80	241	5th December 1884.							5,452·80	
3	Ambur Plantation	6·10	241	Do.							6·10	....
4	Arasampettu (Part)	30,714·00	366	14th July 1893	3,048·62	G.O. 1370	10th May 1913					Enc. No. 1 to 7, 9 to 16 and 41 and 42.
								4,414·00	345	16th July 1915		Transferred to Santavasal range.
								4,527·00	G.O. 1444	18th April 1918		Do.
								1,848·00	Do.	Do.		Transferred to Polur range.
5	Arasampettu Extension (Appukal).	9·44	184	19th June 1922							16,885·82	
		800·00	442	15th August 1895							800·00	
6	Vellakal	5,036·80	503	23rd September 1893.							5,036·80	
7	Karuthamalai	20,486·40	555	14th October 1895	217·00	66	14th February 1922					
					176·00	348	29th November 1928.					
		26·35	282	13th September 1924.								
		11·95	8	17th January 1933								
		14·74	131	10th April 1933							20,146·44	
8	Shana Kuppam	13,843·20	212	29th April 1898	114·685	10	12th February 1921					
		2·07	G.O. 3908	4th December 1917	8·20	81	12th July 1915					
		15·20	262	20th September 1923.	1·60	71	9th March 1923				13,735·98	
9	Thellai (Part)	10,760·00	178	29th June 1888								
					1,421·06	G.O. 1370	10th May 1913					Enc. Nos. 20, 21, 19, 18 and 8.
								2,352·00	345	16th July 1915		Transferred to Santavasal range.
								325·24	233	18th April 1918		Do.
					12·45	C, C, P, 82	29th February 1924				6,649·31	
10	Nellimalai	2,796·80	268	1st June 1894	750·80	20	12th January 1926				2,046·00	
11	Athiyoor	4,800·00	238	16th May 1892	62·24	400	3rd November 1919				4,737·76	
12	Kylasagiri	2,534·40	327	28th June 1894							2,534·40	
13	Tiruvallam plantation	464·32	154	3rd May 1919							464·32	
14	Kilminal plantation	150·05	147	21st March 1916							150·05	
15	Vannivedu plantation	57·52	401	28th October 1919	0·41	91	21st March 1925				57·11	
16	Banavaram	1,021·42	36	12th February 1891	0·29	86	4th September 1906					
		45·45	G.O. 1098	20th March 1918							1,064·58	
17	Virinjipuram Bit I	95·91	136	24th April 1919								
	II	26·75	137	Do.								
	III	135·48	138	Do.							258·14	
18	Chennur plantation	129·64	1340	5th December 1884							129·64	
19	Vikramachi plantation	128·99	144	21st May 1889							128·99	
20	Ammundy plantation	163·00	227	7th July 1920							163·00	In three bits of 18·63, 35·77 and 108·60 acres.
	Santavasal Range.											
1	Thellai (Part)	6,529·00	178	29th June 1888								
		350·24	233	18th April 1918							6,879·24	Please see foot note (a).
2	Arasampettu (Part)	4,414·00	345	16th July 1915								
		4,527·00	G.O. 1444	18th April 1918							8,941·00	

Statement of Reserves, Vellore East Division—cont.

No.	Reserve.	Original settlement. Area.	Section 16 Notification. No.	Section 16 Notification. Date.	Disafforestations. Area.	Section 24 Notification. No.	Section 24 Notification. Date.	Transferred elsewhere. Area.	Authority. No.	Authority. Date.	Present area.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
		ACS.			ACS.			ACS.				
							Santavasal Range—cont.					
3	Puthur	18,457·60	179	8th September 1888 ..	6,616·60	G.O. 1370	10th May 1913 ..	..	..	..	..	Enc. Nos. 39, 40, 41 (part), 45 to 48, 50, 51,52 (part) and 67.
					38·17	229	17th September 1921.	..	..	..	11,802·83	
4	Santavasal	9,670·40	302	5th June 1893 ..	26·77	G.O. 1312	9th July 1919 ..	..	..	..	..	
		91·64	51	31st March 1921 ..	..	..	..	..	..	..	9,735·27	16 inclusions.
5	Santavasal extension A and B.	330·80	G.O. 128	6th March 1894 ..	..	..	..	..	..	..	330·80	
6	Malayalam	26,080·00	353	6th August 1891 ..	610·83	G.O. 1312	9th July 1919 ..	..	..	..	..	See foot note (b).
		257·49	51	31st March 1921 ..	..	..	..	..	..	..	25,726·66	
7	Karnatigiri	7,270·40	241	5th December 1884 ..	..	..	..	..	..	..	7,270·40	
							Polur Range.					
1	Patrakad	25,254·00	181	3rd July 1888 ..	1,461·53	G.O. 1370	10th May 1913 ..	..	..	..	23,792·87	Enc. Nos. 61 to 64 75 to 77, 78 bit II (part), 79 to 81, 82/4, 83, 84, 86/2, 87 to 90, A difference of 0·40 acre could not be reconciled.
2	Veerappanur	31,468·80	180	3rd July 1888 ..	8,325·19	G.O. 1370	10th May 1913 ..	..	..	..	..	
					11·76	229A	17th September 1921.	..	..	..	23,131·85	Enc. Nos. 44, 49, 68 to 74, 78 bit I, II (part) III to VI, 91 and 92.
3	Periamalai	6,969·60	513	1893	..	..	..	..	..	..	6,969·60	
4	Mulakad	15,744·00	72	1894	..	..	..	..	..	..	..	
		25·94	183	19th June 1923 ..	60·95	90	21st March 1922 ..	..	..	..	..	
					179·70	G.O. 1370	10th May 1913 ..	..	..	..	15,529·29	Enc. Nos. 82/2, 84, 81 and 86/1.
5	Arasampettu (Part) ..	1,848·00	G.O. 1444	18th April 1918 ..	..	..	..	..	..	..	1,848·00	
	Arasampettu Extension ..	24·44	82	25th October 1918 ..	..	..	..	..	..	..	24·44	
							Tiruvannamalai Range.					
1	Ponniar	26,897·20	210	18th May 1897 ..	..	..	..	..	..	..	26,897·20	
2	Valasamalai	7,625·60	284	18th May 1895 ..	..	..	..	..	..	..	7,625·60	
3	Natampalli	5,188·50	532	7th November 1894	..	..	..	..	..	..	..	
		5·91	148	5th May 1922 ..	..	..	..	..	..	..	5,194·41	
4	Perungalathur Swamimalai.	6,055·70	286	6th August 1887 ..	..	..	..	..	..	..	..	
		33·63	148	5th May 1922 ..	..	..	..	..	..	..	6,089·33	
5	Pavunjipattu	4,360·00	25	18th May 1894 ..	38·00	260	20th September 1923.	..	..	..	..	
					8·12	145	18th May 1925 ..	..	..	..	4,313·88	
										Total ..	298,883·26	

(a) This area differs from that shown as transferred from the Odagathur range in item No. 9 above. The discrepancy requires verification.

(b) This area probably excludes the area of enclosures disafforested under G.O. No. 1370, dated 10th May 1913. The Register of Reserves is not clear on this point. It would seem that deductions for such enclosures have been made from the areas of the adjoining reserves into which the enclosures overlap.

33. *Unreserves.*—Though the unreserves are not under the administrative charge of the District Forest Officer, the extraction of sandalwood and the disposal of minor forest produce from such lands is carried out by the forest department, and the revenue derived from sales, by the revenue department, of other forest produce is incorporated in the divisional accounts.

34. *Panchayat reserves.*—Between December 1914 and August 1928, 144 reserves, aggregating 325,192·13 acres were transferred to panchayat control. A list of these reserves is given in Appendix III.

35. *Position of sandal on patta lands.*—Paragraph 4 of Government Order No. 1462, Revenue, dated 10th June 1907, read together with agreements executed by pattadars in consequence thereof, clearly shows that all sandal trees growing on patta lands on the Javadis assigned after 1907 are the property of Government. Except in the Tiruppattur Javadis of the Vellore West division, no pattas were issued prior to this date. Copies of the Government Order and the form of agreement executed by pattadars are given at Appendices IV and V respectively.

36. *Land revenue administration in the Javadi Hill villages of the Polur and Santavasal ranges.*—Land revenue administration is at present controlled by the forest department in the hill villages of the Tiruppattur Javadis of the Vellore West division. The main reasons for this deviation from the usual system of control by the revenue department were to enlist the co-operation of the 'Malayalees' (a hill tribe cultivating the enclosures on the Javadis) in protecting the valuable sandal forests on the hills, and to remove the dual control which must exist as long as the revenue and forest departments work side by side in these tracts.

37. At a conference held on the 19th June 1933 at Tiruppattur, at which the Collector, North Arcot, the Conservator of Forests, Salem Circle, and the District Forest Officers, Vellore East and West divisions were present, it was decided that land revenue administration by the forest department should be extended to the Javadi hill villages of the Santavasal range during the then current fasli (1933–34) and to the remaining hill villages in the Polur range in the next fasli year. The actual details relative to the proposed extension of the system were worked out and submitted to Government, who have ordered that the proposals should be renewed in 1936-37, as they are unable to sanction them at present.

SECTION 9.—RIGHTS AND CONCESSIONS.

38. *Granted at settlement.*—The various rights and concessions, communal and public admitted at the time of settlement are recorded in the Section 16 Notifications relative to each reserve. The numbers and dates of these notifications are given in columns (4) and (5) of the list of reserves in paragraph 32 above.

39. *Granted subsequent to settlement.*—The undermentioned concessions have been granted from time to time, subject to definite conditions and in return for certain services to be rendered to the department :—

(*a*) *Concessions under the 'Forest village System'.*—Sanction for the introduction of the 'Forest village System' in the Javadi hill reserves of the Polur and Santavasal ranges was conveyed in G.O. No. 2687, dated 3rd December 1915, and further elaborated in B.P. Miscellaneous No. 15, dated 10th January 1917. In 1925 Mr. Gaudoin, in paragraph 37 (i) of his working plan for the then South Vellore division, summarises the system as follows :—

> "Under this system the reserved forests on the Javadi plateau, where numerous 'malayalee' villages are scattered about as enclosures, are divided into grazing blocks. Each village or group of villages is given a grazing block and is responsible for its protection from thefts, to keep sandal trees free of cover and climbers and to supply labour (on payment) for any special works undertaken by the department. In return the department grants the concession of refunding annually to the 'Malayalees' the full amount of grazing fees paid by them if protection and co-operation are found good in their respective grazing blocks. The grazing fees, at three annas per cow unit, are fixed on the basis of a triennial census of cattle taken in each village. No possibility is fixed. Refunds are proportionately reduced, or entirely withheld according as protection and co-operation have been fair or bad. The 'Malayalees' are given further concession of free removal of (unclassified) timber, fuel, bamboos and thatch grass for agricultural and domestic purposes."

(*b*) *Extension of the 'Forest village system' to the hill villages of that part of the Thellai reserve situated in the Odagathur range.*—This area originally fell under the scope of (*c*) below, but the Chief Conservator of Forests, in his Proceedings Miscellaneous No. 342, dated 13th July 1922, sanctioned the introduction of the 'forest village system' briefly described in (*a*) above.

(c) *Concession to graze cattle in reserves on payment of half the usual grazing fee.*—In G.O. No. 1720, dated 25th May 1910, the malayalee villages of the Attiyur and Arasampet reserves of the Odagathur range were granted the concession of grazing their cattle in reserves on payment of half the usual grazing fees on the following conditions :—

(i) They will do all in their power to prevent fires and if there is a fire they will take prompt steps to extinguish it.

(ii) They will on no account damage by hacking or otherwise sandalwood trees growing in reserves, unreserves and patta lands.

(iii) They will not hack bamboos for the purpose of feeding cattle.

(iv) They will not keep a larger number of goats than necessary for domestic purposes and will see that they do not browse in reserves.

(v) They will not permit ryots from the plains to pen cattle within their village limits unless they produce an order from the District Forest Officer permitting them to do so. In any case they will report the arrival of such cattle as soon as possible to the Range Officer.

(vi) The concession may be withdrawn at once, if any, or all, of the above conditions are violated.

40. *Enclosures.*—Reference has already been made in paragraphs 29 and 30 above to the enclosures on the Javadi hills and their disafforestation in 1913. The following is a list of such enclosures :—

List of enclosures on the Javadi Hills.

Block number. (1)	Name. (2)	Area. (3) ACS.	Reserved forest from which disafforested. (4)
1	Kunampalli	4·00	Arasampettu
2	Alleri	12·32	Do.
3	Do.	10·90	Do.
4	Do.	35·14	Do.
5	Do.	5·24	Do.
6	Do.	283·07	Do.
7	Marudavellimodu	32·74	Do.
8	Periathatankuttai	71·40	Thellai.
9	Do.	8·64	Arasampettu.
10	Do.	3·75	Do.
11	Do.	2·32	Do.
12	Puthu Alamarthy kollai	5·00	Do.
13	Elluparai	39·50	Do.
14	Do.	7·30	Do.
15	Muthunur	6·97	Do.
16	Elluparai	16·74	Do.
17	Not disafforested being unoccupied.		
18	Kunrain group	405·67	Thellai.
19	Butchikavandan valasai	5·70	Do.
20	Jaratha kollai	850·60	Do.
21	Yerimodu	87·69	Do.
22	Neplampattu	374·23	Thellai and Malayalam.
23	Amerdi	25·93	Do.
24	Palapiranpatti	34·47	Do.
25	Kanamalai	211·02	Malayalam.
26	Do.	37·49	Do.
27	Elanthampattu	26·40	Do.
28	There appears to be no enclosure bearing this number which is mentioned in the Government Order.		
29	Elanthampattu	59·72	Malayalam.
30	Nirthumbai	95·06	Do.
31	Nagalur	151·03	Do.
32	Pallathur	140·42	Thellai and Malayalam.
33	Santhanpattu	3·76	Do.
34	Santhanpattu	51·96	Thellai.
35	Kotaiyam	63·78	Do.
36	Keeranur	146·72	Do.
37	Nekkini	9·06	Do.
38	Do.	176·61	Do.
39	Selathu madikai	220·24	Puthur.
40	Chinnoor and Pelampattu	261·59	Do.
41	Tongamalai group	3,648·37	Puthur and Arasampettu.
42	Kottansetti	154·99	Arasampettu.
43	Not disafforested being unoccupied.		
44	Mulluvadi	165·66	Arasampettu.

List of enclosures on the Javadi Hills—cont.

Block number.	Name.	Area.	Reserved forest from which disafforested.
(1)	(2)	(3)	(4)
		ACS.	
45	Kudikam	134·06	Puthur.
46	Koraimadovu	58·62	Do.
47	Periapanaparai	157·69	Do.
48	Do.	44·56	Do.
49	Melmarathur	26·73	Veerappanur.
50	Muttanathur group	4,306·90	Puthur.
51	Eraiyur	41·88	Do.
52	Kilkanavayur	33·16	Puthur and Malayalam.
53	Melkanavayur	145·04	Malayalam.
54	Puliayankuppam	6·76	Do.
55	Do.	388·25	Do.
56	Murukkamandai	60·36	Do.
57	Shembaka tope	318·50	Do.
58	Palamadi	31·60	Do.
59	Pattimalai	121·04	Do.
60	Nellimandai	7·66	Do.
61	Kallathur	167·67	Patrakad and Malayalam.
62	Patrakad	29·36	Patrakad.
63	Kuttakarai	148·32	Do.
64	Peruveli	308·61	Patrakad and Malayalam.
65	Singadu	51·01	Malayalam.
66	Pudupattavalai	18·84	Do.
67	Valethambe	143·53	Puthur.
68	Do.	24·88	Veerappanur.
69	Mandaparai and Kallaparai	260·55	Do.
70	Veerappanur	16·00	Do.
71	Jadayanur	25·59	Do.
72	Veerappanur	7·31	Do.
73	Do.	1,666·99	Do.
74	Pudupattu	474·14	Do.
75	Odamangalam	297·01	Patrakad.
76	Thumbakollai	63·03	Do.
77	Periamalai	56·17	Do.
78	Bit I—Komattiyur	2,018·01	Veerappanur and Patrakad.
	Bit II—Komattiyur	1,250·91	Do.
	Bit III—Komattiyur	383·60	Do.
	Bit IV—Komattiyur	1,706·51	Do.
	Bit V—Komattiyur	164·77	Do.
	Bit VI—Komattiyur	255·99	Do.
79	Vedatope	53·33	Patrakad.
80	Ambatan kollai	44·96	Do.
81	Koleri	6·90	Do.
82–1	Koleri	19·18	Do.
82–2	Kondikallur	19·14	Mulakad.
83	Mamarathur	21·00	Patrakad.
84	Melchappali	54·35	Mulakad and Patrakad
85	Kilchappali	70·21	Mulakad.
86–1, 86–2	Palveri	106·29	Mulakad and Patrakad.
87	Kilpathiapattu	49·97	Patrakad.
88	Patta kovin	13·15	Do.
89	Pelavadi	67·47	Do.
90	Irumayanur	27·11	Do.
91	Natchamalai kottoy	18·75	Veerappanur.
92	Jovur	18·80	Do.
93	Naikaneri	493·53	Ambur.
94	Kamanurthettu	387·05	Do.
95	Panangatteri	329·15	Do.
	Total	25,175·15	

41. *Land leases.*—There are fourteen leases of land for temporary cultivation in the Odagathur range, the areas leased varying from 1·12 acres to 11·42 acres. In each case agreements have been drawn up in accordance with instructions contained in section 163 of the Forest Code. The leases are renewable annually and may be terminated at the discretion of the District Forest Officer. The following is a list of such cases.

List of temporary leases granted in reserved forest.

No. (1)	Person to whom lease have been granted. (2)	Nature of land. (3)	Name of Reserve Forest. (4)	Extent. (5)	Assessment. (6)
				ACS.	RS. A. P.
1	Thatha Kavandan, son of Periapayyan of Thandrayankottai.	Dry land for cultivation.	Arasampettu ..	7·05	5 11 8
2	Kolandai Kavandan, son of Pappana Kavandan, Thandrayankottai.	Do.	Do. ..	3·05	2 13 6
3	Chinnanna Kavandan, son of Chinnayya, Thandrayankottai.	Do.	Do. ..	7·00	5 11 0
4	Vellayya Kavandan, son of Nadupayya, Thandrayankottai.	Do.	Do. ..	2·25	1 13 3
5	Kolandai Kavandan, son of Periapayya Kavandan, Muthankudisai.	Do.	Thellai	11·40	9 4 2
6	Periapayya Kavandan, son of Kolandai, Thellai.	Do.	Arasampettu and Thellai.	4·25	3 7 3
7	Vellayan, son of Swami Kavandan, (2) Kuppan and (3) Vellayan, sons of Kariyan, Thellai.	Do.	Arasampettu ..	11·42	9 4 6
8	Chinnapayyan, son of Kolandai, Thellai.	Do.	Thellai	7·87	6 6 5
9	Jambodayan, son of Ramaswami, Thandrayankottai.	Do.	Arasampettu ..	3·55	2 14 2
10	T. Vellayan, son of Periannan, Thandrayankottai.	Do.	Do. ..	1·12	0 14 8
11	Perumal Kavandan, son of Vadamalai, Alleri.	Do.	Do. ..	6·02	4 14 4
12	Vellayan, son of Venkatachala Kavandan, Alleri.	Do.	Do. ..	1·50	1 3 6
13	Andy, son of Peria Vellayan, Alleri ..	Do.	Do. ..	2·30	1 13 11
14	T. Vellayyan, son of Thandiyan, Alleri.	Do.	Do. ..	7·40	6 0 2

CHAPTER II.—THE FOREST.

SECTION 1.—COMPOSITION AND CONDITION OF THE CROP.

42. The forests are of the mixed deciduous type, irregular and very variable in density. For the purpose of description it is convenient to adopt the classification referred to in paragraph 5 above, viz. :—

(i) *Hill forests,* situated on the Javadis and on the southern slopes of the Kalroyan hills in the extreme south of the division,

(ii) *Plains forests,* including the isolated reserve of Banavaram on the Madras and Southern Mahratta Railway, between Katpadi and Arkonam, and

(iii) *The Palar river plantations* at Tiruvellam, Kilminal, Vannivedu, Virinjipuram, Vikramachi, Senur and Ammundi. The areas of these plantations are to be found in the list of reserves at paragraph 32 above.

Hill Forests.

43. *The Javadis.*—These constitute the most valuable part of the division as they contain about 85 per cent of its sandal and bamboo areas. Sandal and bamboo are both major sources of revenue. Actuals taken over a period of three years, 1932–33 to 1934–35, show that these two items contributed 16 and 30 per cent respectively towards the average annual revenue of this division. (Vide statement at paragraph 226 below.)

44. *Sandal* grows in patches, the area of which may vary from a fraction of an acre up to several hundred acres. The patches are scattered throughout the forest and it is often very difficult to account for the total absence of the species from certain parts which appear to be similar in every respect to neighbouring areas where it is growing luxuriantly. Possibly it may have been distributed evenly in the past, and destroyed by fire or by the wholesale removal of hosts. Natural regeneration is good and as the species is a strong light demander it occurs plentifully in abandoned cultivation, round enclosures and along paths and boundary lines. The fact that in areas once under cultivation, the soil has been worked up and exposed to the action of weather and to the visits of birds, which feed on sandal fruit, probably also accounts for such areas being well stocked.

45. *Bamboo.*—Two species, *Dendrocalamus strictus* and *Bambusa arundinacea* occur, the former growing mostly on slopes above about 1,500 feet, while the latter is confined to the plateau and bottoms of valleys down to about 800 feet. Both species are frequently found mixed over comparatively large areas on the plateau. In the valleys *Bambusa arundinacea* grows to the almost total exclusion of *Dendrocalamus strictus.*

46. There is also a variety of *Bambusa arundinacea,* locally known as 'Iruvarai,' which is less thorny than the ordinary large bamboo, the clumps less congested and the culms thicker walled. In fact it is sometimes mistaken for *Dendrocalamus strictus.*

47. *Dendrocalamus* grows ordinarily to a girth of about 8 inches at the base, while *Bambusa arundinacea* attains, in places, a corresponding girth of about 18 inches. In parts of Arasampettu, Veerappanur and Malayalam reserves, *Dendrocalamus strictus* grows almost solid and the culms are used as lance staves for the Indian cavalry and as lathis for the police force.

48. Mention should here be made of a most deplorable state of affairs brought about by overcutting *Dendrocalamus strictus* around enclosures, hacking for fodder in accessible localities and the removal of tender culms for basket making. *Bambusa arundinacea*, though less susceptible to damage, has also been badly overworked and culms cut at anything from 5 to 15 feet from the ground. This subject is further dealt with in paragraphs 79 and 173 below.

49. *Flowering and dying of bamboo.*—In paragraph 4 of his working plan for the bamboo forests of the South Vellore division, Mr. K. R. Venkataramana Ayyar, in 1919, records that a gregarious flowering of *Bambusa arundinacea* appears to have taken place in about the years 1895 to 1897, while *Dendrocalamus strictus* similarly flowered and died in 1900. Previous flowering of *Dendrocalamus strictus,* possibly sporadic, in about 1878 is also recorded, but no details of this are available. At the time of writing this plan, flowering is again in progress, gregariously in the case of *Bambusa arundinacea* and sporadically in the case of *Dendrocalamus strictus.* It was first noticed in June 1933 in the Patrakad reserve and since that date has been spreading gradually. The earliest record of flowering in 1878 does not appear to be correct for seventeen to twenty-two years only appear to have lapsed between it and the next flowering in 1895–1900, while the interval between the commencement of the last flowering and the commencement of that now in progress in 38 years.

50. *Other species.*—The growth of other species varies with the conditions of the locality. A few isolated trees of teak, rosewood, *Pterocarpus marsupium* and *Terminalia tomentosa* are to be found, but these are stunted and ill grown. Except for sandal and bamboo the crop is generally unsaleable and therefore valuable only as hosts for sandal and as a soil cover. Too much emphasis cannot however be placed on its value as a soil cover and an important factor in flood control and prevention of soil erosion.

51. *Undergrowth.*—The undergrowth is for the most part of the persistent thorny type in which *Solanum indicum, Pterolobium indicum, Carissa carandas* and *Euphorbia spp* predominate. Occasional patches of grass are seen and generally indicate a shallow and impoverished soil. As one would expect, creepers and climbers are not predominant, although they do sometimes arrest one's attention when they grow into and weigh down the crowns of healthy young sandal trees. This usually occurs on the outskirts of enclosures and abandoned cultivation where light conditions are favourable. The most commonly met with climber is *Acacia intsia.*

52. *Prickly pear* (*Opuntia dillenii*) exists, but its spread has been checked very efficiently by the activity of the Cochineal insect. The writer has not yet seen a really vigorous plant in the division.

53. *Lantana.*—Except for a few patches, aggregating some 320 acres in extent, in the Arasampet, Virappanur and Patrakad reserves, lantana is absent from the Vellore East Javadis. This is very remarkable in view of the fact that the pest covers extensive areas in the adjoining Vellore West division.

54. *The Kalroyan Hills.*—The northern slopes of these hills, comprising the Valasamalai, Nattampalli and Perunkolathur Swamimalai reserves, support a type of forest similar to that on the Javadis, except that sandal has appeared comparatively recently. This latter fact is evident not only from the size of the trees, but also from the almost complete absence of dead wood. The species shows signs of spreading rapidly.

55. Over about 1,500 acres on the Valasamalai plateau timber species are fairly well represented, but the trees are generally poor specimens, being ill-shapen, gnarled and of poor height growth. A rank growth of coarse grasses either forms the only undergrowth or is prominent in it. Apart from the degraded condition of the area, due doubtless to fires, the situation is inaccessible, so much so that even illicit removals are rare.

Plains Forests.

56. These forests are composed of an irregularly stocked low scrub of poor density often degenerating into sparse bushes with occasional ill-shapen and stunted trees. Easy accessibility, and consequent illicit felling and overgrazing, coupled with less favourable conditions of temperature and rainfall are the chief factors by which this degraded state has been brought about. The poorest areas are to be found in the Kylasagiri, Appukal, Nellimalai, Shanankuppam and Vellakal reserves of the Odagathur range.

57. The following species are well represented, though the trees are poor specimens. Girths exceeding about 2 feet 6 inches are seldom found.

Chloroxylon swietenia	*Stereospermum suaveolens*
Albizzia amara	*Cleistanthus collinus*
Albizzia lebbek	*Azadirachta indica*
Acacia sundra	*Diospyros spp.*
Hardwickia binata	*Strychnos nuxvomica.*
Anogeissus latifolia.	*Strychnos potatorum*
	and Erythroxylon monogynum.

58. *Sandal* is found scattered in places and seems to have been introduced artificially by occasional distribution of seed by forest guards during the course of patrolling. It is found chiefly along footpaths, road margins, reserve boundaries, etc. In many cases specimens are small and unhealthy looking and it is doubtful if they will ever grow large enough to produce heartwood. On the banks of streams and where host conditions are more favourable, the sandal, where it occurs, is healthy and shows signs of spreading.

59. *Teak, Pterocarpus marsupium* and *rosewood* are rare, stunted and gnarled, due of course to repeated illicit cuttings.

60. *Tamarind* is very common and is usually the best tree in the forest. In the dry season it retains its foliage while everything around it is parched and leafless. It is not felled as fuel, as it is more valuable on account of its fruit, an important minor forest product. There is little doubt that the species is particularly suitable to this dry, degraded type of forest. In the Thellai valley it constitutes about 50 per cent of the crop.

61. *Bamboo.—Dendrocalamus strictus* is absent. *Bambusa arundinacea* is found near the outer slopes of the hills in the vicinity of streams and water courses ; but nowhere in the plains does it approximate the vigour with which it grows in the hill forests.

62. *Prickly pear* (*Opuntia dillenii*).—This species used to be common in the plains forests, and troublesome, but never to a degree sufficient to cause alarm. However, consistent with the then general policy for its complete eradication throughout the Presidency, the Cochineal insect was introduced in 1931 and what remains of the prickly pear to-day shows that it is definitely a dying species.

63. *Lantana* occurs sporadically over about 900 acres in Arasampet, Vellakkal and Santavasal reserves and along the banks of the Ponniar river in the Tiruvannamalai range. It does not appear to be spreading and the local villagers say that it has been in its present condition for several years.

Palar river plantations.

64. These plantations were started in 1873 and planting continued up to 1890. Only *Casuarina* was planted and the rotation adopted was 10 years. In 1890 a severe drought occurred and thousands of trees died. Nothing more appears to have been done till 1896, when Mr. Popert, then the Conservator of Forests, Southern Circle, ordered that blanks should be planted up with *Albizzia lebbek, Albizia amara, Melia indica, Engenia jambolana, Pithecolobium dulce, Pithecolobium saman, Cassia florida, Cassia roxburghii, Zizyphus jujuba, Acacia leucophlœa, Caesalpinia coriaria, Hardwicika binata, Terminalia arjuna, Terminalia belerica, Terminalia tomentosa, Berrya ammonilla* (Trincomale wood) teak, red-sanders, mahogani, tamarind and palmyrah. It is recorded that the probable reason for discontinuing the sowing of *Casuarina* was that the area had already yielded three crops of the species and that the soil was incapable of sustaining a fourth crop.

65. As regards the present condition of the plantations, the stocking is very irregular. This is probably due to abruptly varying soil conditions. Large calcarious, usually low lying, blanks occur. The results of early sowings show that the species most suited to the locality are tamarind, *Pithecolobium saman, Pithecolobium dulce, Melia indica,* and *Terminalia arjuna.* All other species have failed. *Terminalia arjuna* is the only species which has succeeded in the calcarious blanks, which become water-logged in rainy weather.

66. *Red sanders.*— The species has established itself successfully as a pure crop over about 25 acres in the Senur plantation. The rate of growth here is, it is stated, up to date, better than it is in districts where the species grows naturally. There is a prolific crop of seedlings under each parent tree, but most of them die back annually. The cause for this is believed to be root competition and is being investigated by the Provincial Silviculturist. In the other plantations occasional trees are found scattered in places.

67. *Cassia siamia,* introduced at a later date, is growing very well indeed and its reproduction by coppice shoots is particularly good. A shoot one season old was measured and found to be 25 feet in height.

68. *Sandal* of varying age and density is found practically throughout and is flourishing. In fact, in Vikramachi and Virinjipuram plantations it is so dense that it needs immediate thinning. It probably has its origin in haphazard scattering of seed by subordinates walking along inspection paths. There is no doubt that the species is spreading rapidly.

69. *Undergrowth.*—There is practically no undergrowth where *Pithecolobium dulce* has established itself. Elsewhere lantana and spear grass are found extensively and where these do not occur *Zizyphus jujuba* predominates. *Cassia auriculata* occurs sparsely in the blanks.

70. *Prickly-pear* (*Opuntia dillenii*).—In his working plan for the Palar plantations, Mr. T. N. Hearsey, in 1916, records that there was a good deal of prickly-pear in Virinjipuram, while in the northern part of Vikramachi the growth was very dense. To-day the pest is almost extinct, once more thanks to the Cochineal insect.

71. *Botanical list.*—A botanical list of trees, shrubs and climbers found in the division is given in Appendix VI.

SECTION 2.—INJURIES TO WHICH THE CROP IS LIABLE.

72. By far the most serious damage to the crop is caused wilfully by man. The plains forests are easily accessible from the surrounding villages, while those on the hills are interspersed by numerous enclosures. Offences are of daily occurrence, although the vast majority of them pass unnoticed. The following statement of detected cases will perhaps give some idea of the extent of the damage for which man is responsible. The figures represent annual averages for a period of ten years, 1924–25 to 1933–34.

Statement of Offences.

Nature of offence.	Odagathur range.	Santhavasal range.	Polur range.	Tiruvanna-malai range.	Division.
Injury to forest by fire	0·7	4·2	7·1	0·9	12·9
Unauthorized felling and removal of forest produce	423·7	123·3	103·8	227·3	878.1
Illicit grazing	192·6	40·8	24·5	48·5	306·4
Other offences	8·2	4·4	2·0	4·2	18·8
Totals ..	**625·2**	**172·7**	**137·4**	**280·9**	**1,216·2**

73. The various forms of damage are considered below.

74. *Fire.*—Fires do an immense amount of harm to the forest, both directly by destroying growth, especially the scanty and much wanted natural regeneration, and indirectly by stimulating the growth of grasses and other undesirable weeds. A striking example, though perhaps an extreme case, of the manner in which undesirable weeds repond to fire is to be found on the fire line running up the Karnatigur hill in the general direction of the bridle path. Repeated burning has greatly increased the growth of rank grasses and in places where the fire has been very intense, generally on the lower sides of the zigs where grass and other inflamable material has naturally piled itself up, a prolific growth of *Pterolobium indicum* has appeared and formed itself into dense impenetrable thickets to the complete exclusion of other species. It is even spreading into places where a reasonably good canopy exists.

75. Fires are particularly destructive to sandal, which is very fire sensitive. The bark as well as the cambium of even large trees is often completely destroyed on the fire side. Regeneration in burnt areas is absolutely wiped out.

76. *Theft.*—Theft of small timber for agricultural implements and for building huts is the commonest form of offence. As generally only valuable species are removed, the forest is gradually becoming depleted of such species. Apart from the actual loss of material, the manner in which the removals are effected does a considerable amount of harm. Trees and saplings are felled three to four feet from the ground and are thereby not given a chance of reproducing themselves by coppice shoots. Species which suffer most are *Chloroxylon swietinia*, *Acacia sundra*, *Acacia leucophlœa* and *Albizzia lebbek*.

77. Illicit felling of sandal for the purpose of selling the heartwood is rare. The opening up of the forest and the operation of the sandalwood transit rules are the principal factors which have almost brought about the disappearance of theft of this sort.

78. Firewood is extensively stolen, but such removals are usually confined to dead material. Bamboos are sometimes removed, but a much more serious form of damage is the lopping of *Dendrocalamus strictus* for cattle fodder. This brings us to the next form of damage, viz., lopping and hacking.

79. *Lopping and hacking.*—*Dendrocalamus strictus* is more frequently damaged in this way than is *Bambusa arundinacea.* Brief reference has already been made in paragraph 48 above to the present general degraded state of the bamboo areas. Mr. C. C. Wilson, Conservator of Forests, who prepared the present sandalwood working plan for the Javadi and Yelagiri (Vellore West Division) hills in 1916, is of opinion that the stock of *Dendrocalamus strictus* has 'definitely and gravely' deteriorated since that date. In 1924, Mr. A. V. Sundaram, Extra Assistant Conservator of Forests, was placed on special duty to consider measures to improve the condition of the bamboo forests of the Polur range, and he records that two of the chief factors which contributed to the unsatisfactory state of affairs were the lopping of *Dendrocalamus* culms for cattle fodder and cutting the top ends for 'valichals' (one season old splits used for basket-making) and 'afinis' (inner soft pliable splits used as fibre for tying). Other reasons amounting to a breach of silvicultural regulations are dealt with under 'Systems of management and their results' in Chapter V.

80. Occasional lopping of sandal is met with. Fortunately this form of evil seems to have decreased very considerably in recent years. In paragraph 11 (*c*) of his working plan referred to in the foregoing paragraph, Mr. C. C. Wilson records " . . . . and it is their (Malayalee) herdsmen who lop the branches of and even fell, large sandal trees to provide fodder for cattle and goats. . . ." In an area of 301 acres in the Puliyur unreserve of the Vellore West division, Mr. Wilson counted 216 sandal trees which were illicitly felled for this purpose. Undoubtedly the same state of affairs existed in the Vellore East division also. The disappearance of the evil is due to the special protection which sandal enjoys under the 'Forest Village System,' introduced in 1917. [Vide paragraph 39 (*a*) above.] The reaction however has been unfortunate for the 'malayalee,' while leaving sandal alone, has concentrated his efforts on the wholesale lopping of *Dendrocalamus strictus.*

81. *Bark stripping.*—Sandal trees are sometimes barked for the purpose of chewing. In paragraph 11 (*c*) of his working plan, Mr. C. C. Wilson further records, " . . . every path on the hills is lined by decrepit half flayed sandal trees in a more or less dying condition. . . ." Although this form of damage is not nearly as bad as it was, it is still in evidence and is now probably due more to the mischief of cattle boys than to the removal of bark for eating.

82. Other species are often found stripped of their bark for the extraction of fibre. The most striking of these is *Hardwikia binata.* In the Palar river plantations, efforts at introducing the species have in many cases failed as promising young saplings have been completely stripped of their bark.

83. *Animals.*—The damage caused by wild animals is inconsiderable as the fauna of the district is markedly scanty.

84. *Grazing.*—The damage done by cattle is twofold, viz.:—(i) browsing down and trampling on tender seedlings, particularly sandal and (ii) hardening the surface soil by their continual tread and thereby rendering it unsuitable for the reception of seed.

85. The incidence of grazing is dangerously high, specially in the neighbourhood of villages. The average incidence for the division, based on the actuals of the ten-year period 1924–25 to 1933–34, works out to 3·7 acres per 'cow' head, i.e., after reducing all cattle grazed to 'cow' units (1 buffalo = 2 cows and 1 sheep = $\frac{1}{2}$ a cow). Separate details for each range are to be found at Appendix VII.

86. *Climatic.*—Directly, wind is not generally responsible for any serious damage. Whirlwinds occasionally occur at the commencement of the south-west monsoon, but these are of mild intensity and do little or no damage. Indirectly, the damage due to wind is considerable, for the east wind which blows throughout the fire season is an important factor in causing the spread of fire and often renders control impossible when a fire has occurred. Abnormal distribution of rainfall is of some importance in that it has a direct bearing on the fire season, the duration and intensity of which depend on the amount of rain precipitated in the preceding north-east monsoon.

87. *Injurious plants.*—Among these may be mentioned lantana, grass, *Pterolobium indicum* and creepers and climbers generally. Lantana and grass are indirectly important on account of the risk from fire in areas where they grow. *Pterolobium indicum* forms itself into dense thickets and prevents the seed of other species from reaching the ground. It may perhaps, because of its evergreen nature, have the advantage of acting as a fire break, but this advantage could never be of any value in areas where the species has established itself to the complete exclusion of everything else.

88. Creepers and climbers are not a serious factor. They occur, but do not grow to any size. *Acacia intsia* is the commonest, and is occasionally found growing into and weighing down the crowns of sandal trees.

89. '*Spike*' *disease in sandal.*—At the time of writing, the division is practically free from 'spike.' After the enumeration and detailed stockmapping of sandal had been completed, eight infected trees were found in the specially protected block near Patrakad rest-house. The infected trees are being extracted and measures taken to prevent the spread of the disease. A word of warning must however be given regarding an appearance, not altogether unlike 'spike,' which the species assumes in some places, generally of poor quality, at the commencement of the growing season. At this time the size of the newly formed leaves is considerably reduced and the distance between the insertions of the alternate pairs is greatly decreased. The tree will also have shed most of its leaves of the previous season. The 'spike' like appearance of the terminal branches with small, new leaves clustered together is striking. Two such specimens were marked by the writer and carefully watched. As the growing season progressed, and more leaves were added to the crown, the trees no longer looked suspicious but took on their usual graceful appearance.

CHAPTER III.—UTILIZATION OF THE PRODUCE.

SECTION I.—AGRICULTURAL WANTS AND CUSTOMS OF THE PEOPLE.

90. *The population.*—The population of the neighbouring plains villages need not be described. The inhabitants of the hill tracts are a hybrid race known as 'Malayalees,' and are said to have descended from the Vedars, Vellalas and Goundars. Their pursuits are purely agricultural.

91. *Wants of the population.*—The main requirements of the population are fuel, small timber for agricultural implements and building purposes, bamboos, green leaf manure, thatch fodder and broom grass and grazing.

92. *Fuel and small timber.*—In the plains and in the Kalroyan hills the fuel and small timber requirements of the villagers are met largely from panchayat reserves, and private holdings and by illicit removals. Annual clearing of newly assigned pattas and of sivayijama lands is also a source of supply. The bulk of the produce felled annually in the several fuel coupes is carted to the towns to meet a larger demand. The inhabitants of the hill villages enjoy the concession of free removal of fuel and unclassified timber, as well as bamboos and thatch grass, for agricultural and domestic purposes in return for protection from theft and fire, tending sandal and supplying labour for any special work undertaken by the department. Vide paragraphs 39 (*a*) and (*b*) above.

93. The species most commonly used for ploughs are *Chloroxylon swietenia* and *Acacia leucophlœa* for the share, *Acacia sundra* and *Grewia tiliæfolia* (when available) for the shaft, while almost any species is used for the handle. Occasionally shares are made of *Anogeissus latifolia*, but only when better species are not available.

94. *Bamboos.*—The requirements of the plains villagers are met by purchase in the local markets or by theft. The latter source is not considerable as the growth of bamboo in the plains forests is very limited. As in the case of fuel and small timber, the villagers on the hills are allowed free removal of bamboos for bona fide domestic purposes.

95. *Green leaf manure* attracted much attention some ten years ago. In paragraph 8 of his working plan, Mr. H. W. A. Gaudoin, in 1925, records "There is not only a demand but a clamour for manure leaf ever since its removal was stopped from 1st July 1917." In his plan Mr. Gaudoin prescribed a Manure Leaf Working Circle, which was composed of reserves which have since passed into panchayat control. Subsequently, steps were taken to supplement this panchayat supply by throwing open, for removals on payment, certain departmental reserves. The subject is further dealt with in paragraph 113 below.

96. *Thatch, fodder and broom grass.*—Considerable quantities of grass, particularly for thatch and making brooms, are removed annually by the villagers in accordance with definite rules framed for the purpose. Vide paragraph 116 below.

97. *Grazing.*—The ryots keep large herds of cattle chiefly for the sake of the manure they yield. The average number of cattle, reduced to 'cow' units, grazed annually for the last ten years is 74,382. Grazing is thus the most important demand of the people.

SECTION 2.—MARKETS AND MARKETABLE PRODUCTS.

98. *Marketable products.*—Consist of sandalwood, bamboos, fuel, charcoal, minor forest produce and thatch, fodder and broom grass. There is practically no marketable timber in the division. The very limited quantity of small timber which is obtained in fuel coupes from time to time goes towards satisfying the requirements of the neighbouring villages for material for agricultural implements, posts, etc., for hut building. The Banavaram reserve and the Senur plantation are leased out annually to the Military Grass Farms for the removal of hay for supply to troops in the Southern Command.

The classification of sandalwood, bamboos and minor forest produce is dealt with in the three following paragraphs.

99. *Sandalwood.*—The classification of finally cleaned stemwood, rootwood and chips is laid down in paragraph 39 of ' Rules regarding selection, felling, cleaning, classification and disposal of sandalwood and the method of maintaining depot accounts and other registers'—Revised edition, 1930. This pamphlet will be referred to in future as the Sandal Extraction Rules.

100. *Bamboos.*—All bamboos are classified by merchants before sale. The statement below gives the local names of the various classes, a brief description of each and the uses to which it is put. The information contained in the statement has been collected partly from paragraph 7 of Mr. K. R. Venkataramana Ayya's working plan for bamboos and minor forest produce in the South Vellore division (1920), and partly from enquiry in the local markets. The costs of collection should really appear in section 4, ' Methods of exploitation and their cost, ' but they are given here so as to avoid repetition of the classification when that section is dealt with.

Classification of Bamboos.

Kind of bamboo.	Number.	Local name.	Brief description.	Uses.	Cost of collections (ex forest depots).
(1)	(2)	(3)	(4)	(5)	(6)
Bambusa arundinacea—extracted green.	1	Doola varai (தூல வாரை).	Mature bamboos above three years old cut usually above 2 nodes from the base, 12 to 24 feet long and 10 to 13 inches girth.	Scaffolding, Pandals, wall plates and ridge pieces.	2 to 4 annas each.
	2	Katta varai (கட்ட வாரை) or Kadai pottu.	Mature bamboos more solid than (1) cut above 2 nodes from the base, 6 to 8 feet long and 9 to 12 inches girth.	Pillars, bressummers and ridge poles.	$\frac{1}{2}$ anna each.
	3	Dera varai (டேரா வாரை).	Thick walled, 10 to 15 feet long and 8 to 10 inches girth at the base.	Tent posts and ridges.	1 anna each.
	4	Yenikkal (ஏணிக்கால்).	Same as (3) but only 6 to 7 inches girth.	Ladders	$\frac{1}{2}$ anna each.
	5	Dokku varai (டொக்கு வாரை) or Udavu (உதவு) or Konai varai (கொனை வாரை) or Monai-kolundu (மொனைக் கொழுந்து).	Portions of culms above (1) to (4), 10 to 15 feet long and about 7 inches girth at the base and 2 inches at tip.	Pandals, rafters for thatched houses, and cross pieces for scaffolding.	3 annas per bundle of 10 pieces.
	6	Kitti baddai or Ani baddai (கிட்டி பத்தை அல்லது ஆணி பத்தை).	No. (2) split into two, three or four equal parts.	Reepers for tiled houses, or cross pieces for frames of single bullock carts. If required for cross pieces of double bullock carts, these are obtained from (3) which is split into two halves.	2 annas per bundle of 20 splits.
	7	Tottil baddai (தொட்டில் பத்தை).	No. (2) split into two halves ..	Diagonal pieces connecting the shaft with the frame of double bullock carts.	$\frac{1}{2}$ anna per pair.
	8	Alagu baddai (அலகு பத்தை).	No. (2) split generally into four or five equal parts but only $4\frac{1}{2}$ feet long.	By weavers	3 annas per bundle of 50 splits.
	9	Kathikkal (கத்திக் கால்) or Karumbu-thotta Gootam.	Lower portions of bamboos which may be green or dry 7 to 9 feet long, and 4 to 6 inches in girth with all but 2 to 3 inches length of branches from each node cut off.	Standards in Sugarcane plantations.	Rs. 2 per 100 pieces.
	10	Simbal (சிம்பல்) ..	Small top ends with branches intact.	Fencing and screens ..	Not usually sold.

Classification of Bamboos—cont.

Kind of bamboo. (1)	Number. (2)	Local name. (3)	Brief description. (4)	Uses. (5)	Cost of collections (ex forest depots). (6)
Dendrocalamus strictus—Extracted green.	1	Vittam (விட்டம்) Nathi (நாத்தி) Dandeethu moongil (தண்டேத்து மூங்கில்).	Solid or nearly solid bamboos, mature, 12 to 15 feet long and 3 to 3½ inches girth at base where it is cut slantwise.	Cross pieces in betel leaf and sugarcane plantations; also for pandals. If split into two halves, used as tie rods for securing the thatch to the roof in thatched houses.	3 annas per bundle of 20 pieces.
	2	Veetu moongil or Urukkali (வீட்டுமூங்கில் அல்லது உருக்களி]	Same as (1) but with the bottom cut square 12 to 14 feet long and 3 to 3½ inches girth at the base.	Roof frames of thatched houses.	3 annas per bundle of 20 pieces.
	3	Valichal (வலிச்சல்) or Veda baddai (வேத பத்தை).	Split bamboos usually obtained from culms less than one year old, cut from 1 to 2 feet above ground. Length 12 feet.	Mats, baskets of sorts, screens and fibre for tying bamboos into bundles.	4 annas per bundle of 50 splits.
	4	Veda Pootti (வேத பூட்டி).	Same as (3) but removed in whole bamboos, the purchaser doing the splitting.	Do.	½ anna each bamboo.
	5	Korathabbai (கொரதப்பை) or Koravalichal (கொரவலிச்சல்).	Same as (3) but 15 feet long..	Do.	8 annas per bundle of 100 pieces.
	6	Alagu baddai (அலகு பத்தை).	Bottom portions, if fairly solid, of No. (1) or (2), split into two halves, 4½ feet long.	By weavers	3 annas per bundle of 50 pieces.
	7	Banathadi or Kuthiraithadi (பாணத்தடி அல்லது குதிரைத் தடி).	Mature solid bamboos 4 to 6 feet long and nearly uniformly 3 to 5 inches girth throughout.	Lathis and walking sticks. Longer ones are in demand for lance staves and tent kanats.	5 annas per bundle of 10 pieces.
	8	Kaman or Kamankuchi (கமான் அல்லது கமான்குச்சி).	About 2-year old bamboos, solid, about 10 feet long and 2 inches girth at base and 1½ inches at top.	Tops of jutkas and country carts.	3 annas per bundle of 30 piecas.
	9	Yethakol (எத்தக்கால்).	Mature straight bamboos with their rhizomes seasoned over a fire in the forest before being transported to forest depots; about 23 feet long and 6 to 7 inches girth at the base.	Picottah poles	3 annas each.
	10	Banakkoloy (பாணக்குழாய்).	Hollow bamboos 4½ feet long and 2 to 3 inches girth.	Cut into smaller pieces about 4 inches long and used for fire rockets.	3 annas per 25.
Dendrocalamus strictus—Naturally dry bamboos.	1	Kattaikal or Goottam (கட்டைக்கால் அல்லது கூட்டம்).	Mature, solid or nearly solid bamboos, obtained from the bottom portions of culms, 4½ feet long and about 5 to 6 inches uniform girth.	Queen posts of roof trusses in thatched houses and also as uprights for the sides of country carts with tops.	3 annas per bundle of 20 pieces.
	2	Jantai or Karnai (ஜண்டை அல்லது கர்னை).	Same as (1) but 6 feet long and 4 to 5 inches girth.	Joists for mud terraces.	3 annas per bundle of 24 pieces.
	3	Toluvam or Anjumolum Kalani (தொழுவம் அல்லது அஞ்சுமுழம் காலணி).	Less solid than (1), 7 to 9 feet long, taken from the bottom portions of culms and 3 to 4 inches girth at base.	Reepers for tiled roof buildings.	Do.
	4	Arumulam Kalani (ஆறுமுழம் காலணி).	Same as (2) but 9 feet long ..	Used for the same as (1).	Do.
	5	Labbakkattu or Sippakkattu (லப்பக்கட்டு அல்லது சிப்பக்கட்டு).	Top ends of bamboos above (3), 6 feet long and 2 to 2½ inches girth at the base.	Flooring in ships carrying a cargo of groundnut.	1 anna per bundle of 24 pieces.

101. *Minor forest produce.*—The chief minor forest products and their uses are—

Serial number and name.	Description and botanical name.	Use.
1 Avaram bark	*Cassia auriculata*	Tanning.
2 Konnai bark	*Cassia fistula*	Do.
3 Gallnuts	Fruit of *Terminalia chebula* ..	Do.
4 Pungam	Seed of *Pongamia glabra* ..	Yields an oil used for dressing leather after it is cured.
5 Sural bark	From the roots of *Ventilago calyculata* and *V. madraspatana*.	Yields a black dye.
6 Kapilapodi	Red powdery glands on the capsule of *Mallotus philippinensis*.	Yields a yellow dye.

Serial number and name.	Description and botanical name.	Use.
7 Tagari	Seed of *Cassia tora*	A mordant used in dyeing.
8 Yettikottai	Seed of *Strychnos nuxvomica* ..	Yields strychnine.
9 Thettankottai	Seed of *Strychnos potatorum* ..	Used medicinally. Also an agent for clearing water.
10 Serankottai	Nuts of *Semicarpus anarcadium*.	Yields an oil used in the manufacture of marking ink and medicinally for external application.
11 Kattamanakku	Seed of *Jatropha curcas* ..	Yields an oil used medicinally for external application.
12 Nellikoy	Fruit of *Phyllanthus emblica* ..	Used medicinally when dry, and is edible when green.
13 Manipungam or soapnut.	Fruit of *Sapindus trifoliatus* ..	Washing and toilet purposes.
14 Tamarind	Fruit of *Tamarindus indica* ..	Edible.
15 Woodapple	Fruit of *Feronia elephantum* ..	Do.
16 Elandai	Fruit of *Zizyphus jujuba* ..	Do.
17 Kalakkai	Fruit of *Carissa carandus* ..	Do.
18 Sarapparuppu	Kernels of the fruit of *Buchanania latifolia*.	Do.
19 Kavadu grass	*Andropogon citratus*	Yields the lemon grass oil of commerce.
20 Honey and bees wax ..	....	....
21 Deer and sambur horns ..	....	....
22 Other miscellaneous products, such as gums, creepers and barks for fibre, etc.	....	....

102. *Markets.*—Sandalwood is sold annually at Tiruppattur and is usually purchased by merchants from Bombay and Calicut. There is practically no local demand. The principal markets for bamboos, fuel and charcoal are Vellore, Ambur, Arni, Polur and Tiruvannamalai. The export of bamboos to neighbouring districts, although dull at the time of writing, was common in the past, the chief outside markets being Cuddalore, Pondicherry, Bowringpet (for the Kolar gold fields), Madras and even Tanjore and Trichinopoly. It would appear that the groundnut trade has a direct bearing on the demand for bamboos in sea port towns. When this trade is flourishing merchants require considerable quantities of bamboos annually for the erection of temporary godowns, cooly sheds and for rough decking for country boats carrying a cargo of this produce.

103. The whole output of avaram and konnai barks, gallnuts and pungam seed is consumed by tanneries within the district. The more important tanneries are at Vaniambadi, Ambur, Vellore and Ranipet. Yettikottai is transported to Madras, whence it is shipped abroad. Soapnut, although it is not much used locally, finds a ready market in Telugu districts and is transported to Tenali, Guntur and Nellore. The small quantity of kapila powder which is collected annually is sold at Arni, Kumbakonam, Conjeeveram and Tiruvattapuram, which are all important weaving centres.

SECTION 3.—LINES OF EXPORT.

104. *Railways.*—The Madras and Southern Mahratta Railway, running approximately north-east and south-west, passes more or less along the northern boundary of the division from Arkonam in the north-east corner, via Katpadi, to Vaniambadi at its western extremity. The South Indian Railway traverses the centre of the division from Katpadi in the north to Tandari in the south. Except for the Palar river plantations and the Banavaram reserve, near Arkonam, the whole of the forest area lies between these two lines.

105. *Trunk roads.*—The Bangalore-Madras road passing through Vaniambadi, Ambur, Vellore and Walajapet runs along the north of the division, more or less parallel to the Madras and Southern Mahratta Railway. The Chittoor-Cuddalore road touching Vellore, Kaniambadi, Santavasal, Polur and Tiruvannamalai is practically parallel to the South Indian Railway.

106. *Other metalled roads.*—There are many other metalled roads and they connect the forest roads either with the railways or with the local markets on the trunk roads.

107. *Forest roads.*—The forests are well provided with roads. The more important roads serving as outlets from the Javadi hills are —

(i) *The Komattiyur-Alangayam ('Gillman') road* running westward to Vaniambadi on the Madras and Southern Mahratta Railway and to the sandalwood sale depot at Tiruppattur.

(ii) *The Komittiyur-Athimur road* running eastwards via Patrakad to Polur on the South Indian Railway. As far as Patrakad it is known as 'Lushington' road.

(iii) *The Komittiyur-Odagathur road* running northwards via Burgur and Melarasampet and joining the main Bangalore-Madras road five miles west of Vellore.

(iv) *The Mandapare-Burgur road* running westwards joins No. iii at Burgur.

(v) *The Nadanur-Kinnekollam road* running more or less north-east via Amerdi and joining the metalled road to Vellore and Kaniambadi some 12 mlies south of Vellore. From Nadanur to Amerdi it is known as 'Latham' road.

(vi) *The Panangatteri-Ambur road* running north-west.

(vii) *The Panangatteri-Odagathur road* running north-east via Asanampet and joining the metalled road from Odagathur to Vellore.

108. The plains forests are served by—

(i) *The Tellai-Kinnekollam road* running east and joiningNo. v. above at Kinnekollam.

(ii) *The Odagathur-Anicut road* running northwards via Pinnathurai and joining the metalled road from Anicut to Vellore.

(iii) *The Shenbakatope-Santavasal road* running eastwards and joining the metalled road from Santavasal to the Arni Road railway station on the South Indian Railway.

SECTION 4.—METHODS OF EXPLOITATION AND THEIR COST.

109. *Sandalwood.*—The exploitation of sandalwood is carried out departmentally. The various stages of the operation are dealt with in the Sandal Extraction Rules (Revised edition, 1930). The cost of exploitation is as follows :—

	Per ton. RS.	A.	P.
(i) Marking and enumerating dead trees for extraction—Quarter anna per acre. Data collected from the Polur and Santavasal ranges for the second and third rotations of Mr. C. C. Wilson's sandalwood working plan show that there are, on an average, 0·24 dead trees per acre and that the average yield of heartwood per tree is 1 qr. 8 lb. 11 oz. Applying these averages to the rate of quarter anna per acre, this stage of the operation costs.	4	0	0
(ii) Extraction, rough cleaning and transport to forest depots, at four annas per quarter	20	0	0
(iii) Reweighing rough cleaned wood at forest depots before dispatch to the sale depot at Tiruppattur	0	8	0
(iv) Transport by road from forest depots to the sale depot at Tiruppattur, for every 50 miles	18	0	0
(v) Transport by rail, Katpadi to Tiruppattur, Santavasal range only	7	0	0
(vi) Reweighing at Tiruppattur and taking to stock	0	10	0
(vii) Final cleaning at two annas per quarter	10	0	0

As transport is effected both by road and railway; and as the length of the leads both from coupes to forest depots and from forest depots to the sale depot at Tiruppattur varies from range to range, it is not possible to arrive at a uniform rate for exploitation for the whole division. For the various ranges it is approximately as follows :—

	Per ton. RS.
Odagathur range	70
Santavasal range	60
Polur range	45
Tiruvannamalai range	80

110. *Bamboos.*—All bamboo coupes are worked through the agency of contractors. Blocks comprising one or more felling series, of three coupes each, are leased out once in three years, the lessee having the right to work only one coupe in each series annually. The costs of collection, ex-forest depots, paid by contractors for the various kinds of bamboo are given in column 6 of the statement in paragraph 100 above.

111. *Fuel.*—All coupes are worked through the agency of contractors. Coupes are generally sold in February and March and the period of working runs from 1st April to 31st March. Payments are made by contractors at the following rates :—

	Per ton. RS.	A.	P.
(i) Felling and loading on to carts	1	4	0
(ii) Carting from coupe to market, per mile	0	2	9

No billetting or stacking is done, the fuel being cut only into cartable sizes.

112. *Charcoal.*—There is no departmental working. Fuel coupe contractors manufacture charcoal in coupes from which either the whole or part of the crop is unsaleable as firewood because of poor demand, inaccessibility or remoteness from markets. The cost of production is as follows: —

	Per ton. RS.	A.	P.
(i) Cutting, burning, filling into bags and loading on carts, at eight annas per bag of 70 lbs.	16	0	0
(ii) Transport from coupe to market, per mile	0	2	0

113. *Green leaf manure.*—Reference has already been made to this subject in paragraph 95 above. After the reserves constituting Mr. Gaudoin's Manure Leaf Working Circle had passed into panchayat control, removals were permitted at Rs. 1–4–0 per cart-load from the reserves of the Odagathur range and at Rs. 2 per cart-load from those reserves in the other ranges, which, in the opinion of the Chief Conservator, could be thrown open for removal (G.O. No. 2268-D, Development, dated 20th December 1929). In the Santavasal, Polur and Tiruvannamalai ranges nine blocks were put up for sale for the first time in August 1933, but owing to inaccessibility and poor growth only four blocks were sold at an average price of Rs. 281 per block. In 1934 the same nine blocks were again put up for sale, but none was sold.

114. *Minor Forest Produce.*—The right of collecting minor forest produce is sold once in five years in the case of konnai, *Cassia fistula,* bark and annually for other kinds of produce. The lease period commences on the 1st July each year and terminates on the 30th of the following June. Collection, ex-forest depots, of the more important products is usually paid for at the following rates :—

(i) *Tamarind.*—In return for collection coolies are given from 1/10 to ½ the quantity collected by them. Where trees are plentiful or when the crop is good, collection is easy and coolies are given a smaller proportion. Conversely, where trees are scattered or when the crop is poor, collection is difficult and coolies receive a larger proportion. Removal of shells and cleaning is paid for at 1 anna per maund of 25 lb.

(ii) Avaram bark (*Cassia auriculata*) 2 pies per lb. or Re. 0–4–2 per maund of 25 lb.

(iii) Konnai bark (*Cassia fistula*) 2 pies per lb. or Re. 0–4–2 per maund of 25 lb.

(iv) Sural bark roots only (*Ventilago calyculata* and *V. Madraspatana*) 2 pies per lb. or Re. 0–4–2 per maund of 25 lb.

(v) Gallnuts (*Terminalia chebula*) 1 anna per measure or Re. 0–12–0 per maund of 25 lb.

(vi) Yettikottai (*Strychnos nuxvomica*) 1 anna per measure or Re. 0–10–0 per maund of 25 lb.

(vii) Tettankottai (*Strychnos potatorum*) ½ anna per measure or Re. 0–4–0 per maund of 25 lb.

(viii) Pungam (*Pongamia glabra*) 8 pies per measure or Re. 0–6–8 per maund of 25 lb.

(ix) Soapnut (*Sapindus trifoliatus*) 9 pies per measure or Re. 0–12–6 per maund of 25 lb.

(x) Kapila powder (*Mallotus philippinensis*) 8 annas per measure.

115. The question of collecting tamarind departmentally was investigated by the working plans staff and from data collected it was considered that the present system of selling the right of collection annually, with that for other minor forest produce, is more profitable than departmental collection would be.

116. *Thatch, fodder and broom grass.*—In accordance with the recommendations of the Royal Commission on Agriculture, 1929, free removal of thatch, fodder and broom grass from the reserved forests by the inhabitants of adjoining villages, is permitted subject to the conditions noted below :—

(i) Removals should be for the *bona fide* domestic and agricultural use of the villagers and not for sale.

(ii) The concession of free removal from any reserve applies only to the villages adjoining it and to no other.

(iii) Removals should be effected only in headloads.

(iv) The concession runs from the 1st September to the 15th April each year.

(v) Breach of any of the conditions will entail prosecution.

(vi) If fires occur or forest growth is damaged by felling, lopping or hacking, not only will the concession be cancelled, but any portion or the whole of the reserves notified may be closed to grazing.

The names of reserves and a list of villages adjoining each is published in the District Gazette annually.

117. *Removal of hay by the Military Grass Farms.*—The Banavaram reserve and the Senur plantation are leased out annually to the Military Grass Farms for the removal of hay at Rs. 4 per ton. Prior to 1933–34 royalty was paid at Rs. 2 per ton only. Cutting and removal is restricted to the period 1st July to the 15th March each year. Stacking and pressing is permitted within the areas in question, necessary precautions being taken to protect buildings and forest growth. Removals are effected by railway from Sholinghur station in the case of Banavaram reserve and Latteri in the case of Senur plantation. Both these stations are on the Madras and Southern Mahratta Railway.

118. *Grazing.*—Grazing, subject to the usual conditions, is allowed in all reserves, with the exception of the following areas :—

(i) Fuel coupes are closed to grazing in the year of felling and for five years after. (Paragraph 18 of Mr. H. W. A. Gaudoin's Working Plan, 1925—for the South Vellore division.)

(ii) All sandal specially protected blocks. (Paragraph 39 of Mr. C. C. Wilson's Sandalwood Working Plan, 1916—for the Javadi and Yelagiri hills.)

(iii) The Banavaram reserve. (Section XXXVI of Mr. V. S. Gurunatha Pillai's Working Plan, 1909—for the East Vellore range.)

(iv) The Palar river plantations. (Section XXXVII of Mr. T. N. Hearsey's Working Plan, 1916—for these plantations.)

119. The grazing year is from 1st July to 31st June. Fees are collected at the following rates :—

	RS.	A.	P.
Local cattle—			
Cow or bull	0	8	0
Buffalo	1	0	0
Sheep	0	4	0
Foreign cattle—Tiruvannamalai range only—	RS.	A.	P.
Cow or bull	1	0	0
Buffalo	2	0	0

Goat browsing is strictly prohibited and no licences are granted for penning cattle in the reserves.

120. The Malayalees of the Javadi hills in the Santavasal and Polur ranges and that part of the Thellai reserve situated in the Odagathur range enjoy free grazing under the terms of the 'Forest Village System'—vide paragraph 39 (*a*) and (*b*) above. The whole of the grazing areas on the plateau and in that part of the Thellai reserve already referred to is reserved exclusively for the exercise of this concession and has been divided into 153 grazing blocks. Plains cattle are not allowed to graze in these blocks.

121. In the Odagathur range the Malayalees residing in the Attiyur and Arasampattu reserves are allowed to graze their cattle on payment of half the usual fees—Vide paragraph 39 (*c*) above.

SECTION 5.—PAST AND CURRENT PRICES.

122. The following statements give the prices obtained for sandalwood, bamboos, fuel and minor forest produce from the date of introduction of the working plan relating to each.

123. *Statement showing the prices obtained for sandalwood—1915-16 to 1934-35.—*

Serial number and classes.	Price per ton in rupees.									
	1915-16.	1916-17.	1917-18.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.	1923-24.	1924-25.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	RS. A.	RS. A.	RS. A.	RS. A.	RS. A.	RS. A.	RS. A.	RS. A.	RS. A.	RS. A.
Billets.										
1 Vilyatbudh (first class)	1,024 0	1,850 0	2,040 0	..	..	..	1,401 0	..	..	..
2 Chinabudh (second class) ..	1,019 0	1,805 0	2,047 8	..	..	..	..	..	..	..
3 Panjam (third class)	1,039 0	1,805 0	2,050 0	..	..	..	..	..	..	..
4 Ghotla (short billets)	1,034 0	1,745 0	2,045 0	..	..	..	..	..	..	..
5 Ghat Badla	970 0	1,730 0 to 1,760 0	2,048 0	1,715 0 to 1,720 0	1,642 0 to 1,650 0	1,725 0	1,353 0 to 1,400 0	1,470 0	1,250 0	1,428 0
6 Bagardad	1,030 0	1,751 8	2,045 0	1,675 0 to 1,700 0	1,615 0 to 1,653 12	1,700 0 to 1,728 0	1,428 0 to 1,457 0	1,400 0	1,200 0	1,431 0
7 Jajpokal (first class)	925 0	1,645 0	2,062 8	1,680 0	1,440 0	1,720 0	1,300 0	1,300 0	1,165 0	1,423 0
8 Jajpokal (second class) ..	920 0	1,635 0	2,040 0	1,720 0	1,725 0	1,710 0	1,338 0	1,310 0	1,100 0	1,360 0
9 Ainbagar	970 0	1,627 8	2,040 0	1,735 0	1,549 3	1,685 0 to 1,686 0	911 0	1,228 0	1,100 0	1,349 0
10 Cheria	870 0	1,462 8	1,880 0	1,730 0	1,502 0	1,657 0	901 0	1,115 0	865 0	1,180 0
Roots.										
11 First class	1,039 0	1,710 0	2,075 0	1,680 0	1,600 0	1,910 0	1,401 0	1,351 0	1,255 0	1,408 0
12 Second class	1,076 0	1,707 0	2,322 8	1,722 8	1,605 0	1,990 0	1,465 0	1,377 0	1,349 0	1,426 0
13 Third class	1,026 8	1,685 0	2,337 9	1,720 0	1,565 0	1,985 0	1,472 0	1,332 0	1,396 0	1,475 0
Chips.										
14 Ainchilta	705 0	1,120 0	1,430 0	1,365 0	1,251 0	1,500 0	803 0	900 0	900 0	1,000 0
15 Hathrichilta	335 0	490 0	920 0	..	..	..	..	..	..	..
16 Mulvachilta	325 0	406 4	625 0	646 4	621 0	1,080 0	541 0	500 0	682 0	591 0
17 Basolabakni	305 0	560 0	780 0	725 0	620 0 to 621 0	952 0	460 0 to 461 0	500 0	730 0	595 0
18 *Sawdust*	580 0	685 0	800 0	1,322 8	1,400 0	1,000 0	601 0	501 0	811 0	880 0

Serial number and classes.	Price per ton in rupees.									
	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.
	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
Billets.										
1 Vilyatbudh (first class) ..	..	..	..	..	..	..	..	..	..	..
2 Chinabudh (second class) ..	..	..	..	..	..	..	..	..	..	..
3 Panjam (third class)	..	..	..	..	..	..	..	..	..	..
4 Ghotla (short billets)	..	..	..	1,655	..	..	..	..	..	..
5 Ghat Badla	1,292 to 1,320	1,438	1,579	1,560 to 1,695	1,505 to 1,515	900	..	1,100	1,029	869
6 Bagardad	1,351 to 1,385	1,477	1,587	1,600	1,550 to 1,555	900	1,100	1,100	1,100	885
7 Jajpokal (first class)	1,235 to 1,249	1,377	1,511	1,555	1,445 to 1,475	..	775	900	894	790
8 Jajpokal (second class) ..	1,251	1,381	1,490	1,540	1,455	750	..	900	925	803
9 Ainbagar	1,248	1,391	1,396	1,485	1,465	900	1,100	1,000	933	818
10 Cheria	1,200	1,370	1,332	1,340	1,420	850	900	900	901	783
Roots.										
11 First class	1,276	1,455	1,525	1,505	1,535 to 1,560	..	1,100	1,100	990	765
12 Second class	1,290	1,429	1,540	1,635	1,540 to 1560	1,540	1,100	1,100	1,070	778
13 Third class	1,320	1,425	1,540	1,650	1,550	900	1,100	1,100	1,102	745
Chips.										
14 Ain chilta	1,121	1,221	1,290	1,330	1,315	800	..	900	910	600
15 Hathri chilta	..	..	..	..	..	..	..	..	..	..
16 Mulvachilta	599	700	855	850	940	..	550	550	547	405
17 Basolabakni	426 to 431	723	925	960	735	..	550	450	495	324
18 *Sawdust*	1,001	1,125	1,176	1,205	1,250	830	1,000	1,000	850	805

Remarks.—The sandal forests of the division yield No. I, II and III class billets. The quantities of these classes sold during 1915-16, **1916-17 and 1917-18 were obtained from healthy trees blown over by the wind in the 1916 cyclone.**

124. *Statement showing prices obtained for bamboo coupes—1923-24 to 1934-35—*

Year of felling.

Felling series.	1923-24. Area of coupe.	1923-24. Price.	1924-25. Area of coupe.	1924-25. Price.	1925-26. Area of coupe.	1925-26. Price.	1926-27. Area of coupe.	1926-27. Price.	1927-28. Area of coupe.	1927-28. Price.	1928-29. Area of coupe.	1928-29. Price.
	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.
Odagathur Range.												
Kottur ..	3,520	2,403	2,650	2,403	3,022	3,050	3,951	1,537	1,735	1,537	3,091	1,537
Karuthamalai.	9,598	1,417	5,758	1,417	4,419	1,300	6,495	1,333	5,095	1,333	4,730	1,333
Naickaneri ..	2,327	2,417	3,400	2,417	1,823	2,400	4 295	625	6,386	625	3,215	625
Asanampet ..	2,522	2,417	3,200	2,417	1,586	2,400	2,705	625	2 393	625	3,470	625
Panankatteri.	1,643	2,417	1,443	2,417	1,996	2,400	1,855	625	1,220	625	2,146	625
Vellakal ..	1,907	2,417	2,464	2,417	1,517	2 400	5,054	625	3,027	625	2,409	625
Thellai ..	3,758	4,685	1,670	4,685	4,798	4,900	3,734	2,200	2,260	2,200	4,662	2,200
Athiyoor ..	2,522	1,420	1,862	1,420	1,508	1,150	4,434	850	2,528	850	1,464	850
Santavasal Range.												
Nikkini ..	1,320	3,042	1,170	3,042	1,410	3,358	1,320	3,358	1,170	3,358	1,410	3,790
Sathampet ..	710	3,042	990	3,042	1,245	3,358	710	3,358	990	3,358	1,245	3,790
Kanamalai ..	576	3,042	715	3,042	512	3,358	576	3,358	715	3,358	512	3,790
Nadanur ..	1,840	3,042	1,376	3,042	1,734	3,358	1,840	3,358	1,376	3,358	1,734	3,790
Puliamkuppam.	1,455	3,333	1,100	3,333	1,434	4,167	1,455	4,167	1,100	4,167	1,434	5,483
Bonganur ..	1,280	3,333	1,100	3,333	1,402	4,167	1,280	4,167	1,160	4,167	1,402	5,483
Shembakatope.	2,340	3,333	1,410	3,333	2,368	4,167	2,340	4,167	1,410	4,167	2,368	5,483
Santavasal ..	1,410	3,333	1,160	3,333	1,410	4,167	1,410	4,167	1,160	4,167	1,410	5,483
Tongamalai ..	1,155	1,108	1,760	1,108	1,463	2,002	1,155	2,002	1,760	2,002	1,463	1,650
Nayakanur ..	1,410	1,108	990	1,108	1,960	2,002	1,410	2,002	990	2,002	1,960	1,650
Kudigam ..	1,185	1,108	1,024	1,108	1,280	2,002	1,185	2,002	1,024	2,002	1,280	1,650
Komiar ..	1,280	1,180	1,600	1,108	1,176	2,002	1,280	2 002	1,600	2,002	1,176	1,650
Polur Range.												
Pudupattu ..	1,620	1,617	1,624	1,617	1,810	1,278	1,620	1,278	1,624	1,278	1,810	1,411
Veerappanur.	1,300	1,617	1,240	1,617	2,067	1,278	1,300	1,278	1,240	1,278	2,067	1,411
Mandaparai ..	950	1,617	910	1,617	1,045	1,278	950	1,278	910	1,278	1,045	1,411
Palamcottai ..	4,288	578	980	578	2,246	556	4,288	556	980	556	2,246	667
Tekkamarathur.	690	578	980	578	746	556	690	556	980	556	746	667
Mottapattu ..	915	578	910	578	670	556	915	556	910	556	670	667
Odamangalam.	1,160	1,234	1,370	1,234	1,280	2,000	1,160	2,000	1,370	2,000	1,280	3,333
Kuttakarai ..	1,800	1,234	1,350	1,234	2,190	2,000	1,800	2,000	1,350	2,000	2,190	3,333
Kondikallur ..	1,900	1,234	1,700	1,234	1,792	2,000	1,900	2,000	1,700	2,000	1,792	1,456
Vedatope ..	840	1,234	960	1,234	1,080	2,000	840	2,000	960	2,000	1,080	1,456
Patavadi ..	1,856	1,234	1,792	1,234	1,090	2,000	1,856	2,000	1,792	2,000	1,090	1,456
Tiruvannamalai Range.												
Valasamalai ..	1,550	556	1,280	556	1,920	1,222	1,550	1,222	1,280	1,222	1,920	1,000
Nathampalli ..	1,160	556	1,280	556	1,155	1,222	1,160	1,222	1,280	1,222	1,155	1,000
Perungolathur Swamymalai.	960	556	896	556	770	1,222	960	1,222	896	1,222	770	1,000

Felling series.	1929-30. Area of coupe.	1929-30. Price.	1930-31. Area of coupe.	1930-31. Price.	1931-32. Area of coupe.	1931-32. Price.	1932-33. Area of coupe.	1932-33. Price.	1933-34. Area of coupe.	1933-34. Price.	1934-35. Area of coupe.	1934-35. Price.
	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.
Odagathur Range.												
Kottur ..	3,451	2,333	1,725	2,333	3,091	2,333	3,451	1,867	1,725	1,867	3,091	1,867
Karuthamalai.	6,495	1,500	5,095	1,500	4,730	1 500	6,495	1,200	5,095	1,200	4,730	1,200
Naickaneri ..	4,295	708	6 386	708	3,215	708	4,295	625	6,386	625	3,215	625
Asanampet ..	2,705	708	2 393	708	3,470	708	2,705	625	2 393	625	3,470	625
Panankatteri.	1,855	708	1,220	708	2.146	708	1,855	625	1,220	625	2,146	625
Vellakal ..	5,054	708	3,026	708	2,409	708	5,054	625	3,026	625	2,409	625
Thellai ..	3,734	4,333	2,260	4,333	4,662	4,333	3,734	4,000	2,260	4,000	4,662	4,000
Athiyoor ..	4,434	1,300	2,528	1,300	1,464	1,300	4,434	1,300	2,528	1,300	1,464	1,300
Santavasal Range.												
Nikkini ..	1,320	3,790	1,170	3,790	1,410	3,842	1,320	3,842	1,170	3,842	1,410	2,667
Sathampet ..	710	3,790	990	3,790	1,245	3,842	710	3,842	990	3,842	1,245	2,667
Kanamalai ..	576	3,790	715	3,790	512	3,842	576	3,842	715	3,842	512	2,667
Nadanur ..	1,840	3,790	1,376	3,790	1,734	3,842	1,840	3,842	1,376	3,842	1,734	2,667
Puliamkuppam.	1,455	5,483	1,100	5,483	1,434	3,523	1,455	3,523	1,100	3,523	1,434	3,800
Bonganur ..	1,280	5,483	1,160	5,483	1,402	3,523	1,280	3,523	1,160	3,523	1,402	3,800
Shembakatope.	2,340	5,483	1,410	5,483	2,368	3,523	2,340	3,523	1,410	3,523	2,368	3,800
Santavasal ..	1,410	5,483	1,160	5,483	1,410	3,523	1,410	3,523	1,160	3,523	1,410	3,800
Tongamalai ..	1,155	1,650	1,760	1,650	1,463	1,375	1,155	1,375	1,760	1,375	1,463	1,021
Nayakanur ..	1,410	1,650	990	1,650	1,960	1,375	1,410	1,375	990	1,375	1,960	1,021
Kudigam ..	1,185	1,650	1,024	1,650	1,280	1,375	1,185	1,375	1,024	1,375	1,280	1,021
Komiar ..	1,280	1,650	1,600	1,650	1,176	1,375	1,280	1,375	1,600	1,375	1,176	1,021
Polur Range.												
Pudupattu ..	1,620	1,411	1,624	1,411	1,810	1,378	1,620	1,378	1,624	1,378	1,810	2,356
Veerappanur.	1,300	1,411	1,240	1,411	2,067	1,378	1,300	1,378	1,240	1,378	2,067	2,356
Mandaparai ..	950	1,411	910	1,411	1,045	1,378	950	1,378	910	1,378	1,045	2,356
Palamcottai ..	4,288	667	980	667	2,246	600	4,283	600	980	600	2,246	667
Tekkamarathur.	690	667	980	667	746	600	690	600	980	600	746	667
Mottapattu ..	915	667	910	667	670	600	915	600	910	600	670	667
Odamangalam.	1,160	3,333	1,370	3,333	1,280	1,875	1,160	1,875	1,370	1,875	1,280	1,667
Kuttakarai ..	1,800	3,333	1,350	3,333	2,190	1,875	1,800	1,875	1,350	1,875	2,190	1,667
Kondikallur ..	1,900	1,456	1,700	1,456	1,792	780	1,900	780	1,700	780	1,792	556
Vedatope ..	840	1,456	960	1,456	1,080	780	840	780	960	780	1,080	556
Patavadi ..	1,856	1,456	1,792	1,456	1,090	780	1,856	780	1,792	780	1,090	556
Tiruvannamalai Range.												
Valasamalai ..	1,550	1,000	1,280	1,000	1,920	1,061	1,550	1,061	1,280	1,061	1,920	780
Nathampalli ..	1,160	1,000	1,280	1,000	1,155	1,061	1,160	1,061	1,280	1,061	1,155	780
Perungolathur Swamymalai.	960	1,000	896	1,000	770	1,061	960	1,061	896	1,061	770	780

125. *Statement showing prices obtained for fuel coupes—1923–24 to 1934–35—*

Year of felling.

Felling series.	1923–24. Area of coupe.	1923–24. Price per acre.	1924–25. Area of coupe.	1924–25. Price per acre.	1925–26. Area of coupe.	1925–26. Price per acre.	1926–27. Area of coupe.	1926–27. Price per acre.	1927–28. Area of coupe.	1927–28. Price per acre.	1928–29. Area of coupe.	1928–29. Price per acre.	1929–30. Area of coupe.	1929–30. Price per acre.	1930–31. Area of coupe.	1930–31. Price per acre.	1931–32. Area of coupe.	1931–32. Price per acre.	1932–33. Area of coupe.	1932–33. Price per acre.	1933–34. Area of coupe.	1933–34. Price per acre.	1934–35. Area of coupe.	1934–35. Price per acre.
	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS. A.
Odagathur Range.																								
Naickaneri ..	111	10 8	135	9 8	108	11 12	128	14 8	80	11 8	..	..	117	7 12	166	8 9	..	..	120	2 8	72	6 0	96	10
Panangatteri.	111	6 4	85	4 0	117	4 0	98	4 5	105	4 1	89	5 4	103	4 12	101	2 4	122	3 4	129	10 8	105	4 4	102	5
Vellakal Ambur ..	47	2 6	45	2 6	50	2 6	55	4 6	60	3 1	..	..	56	2 4	53	4 8	66	1 8	..	..	..	..	..	..
Natchar Kuppam ..	48	3 3	65	3 3	53	3 3	47	2 2	..	..	144	3 0	45	7 0	64	3 8	..	..	53	3 2	46	1 8	46	1 8
Pachar Kuppam ..	64	3 5	74	3 2	62	2 1	30	2 6	56	2 0	37	2 8	73	2 8	83	3 0	..	..	..	..	..	..	53	2 6
Agaram ..	44	3 2	45	3 2	45	3 2	32	2 2	40	2 0	..	..	..	..	36	2 8	50	2 12	..	..	..	..	..	..
Kuppampalayam ..	63	3 4	51	3 4	49	3 4	39	1 5	50	1 13	41	3 12	45	3 4	47	6 4	40	4 0	36	4 12	54	2 12	62	2 8
Pallipattu ..	61	2 7	64	2 7	65	2 7	75	2 0	74	2 13	61	5 4	68	4 4	68	5 0	72	2 8	68	2 0	62	2 8	74	2 8
Kallaparai ..	58	1 0	70	0 14	..	..	68	1 10	92	1 12	94	1 10	..	..	..	..	..	..	..	..	..	..	..	..
Asanampet ..	..	..	..	..	..	..	102	5 0	71	3 10	88	3 12	90	4 0	80	7 8	111	2 8	88	3 4	..	..	84	2 10
Rasimalai ..	63	4 14	70	3 13	60	7 5	84	8 8	67	3 0	76	7 12	..	..	71	2 12	..	..	..	..	..	..	..	..
Kachiguddai ..	42	1 15	40	1 0	41	1 4	36	1 12	40	3 1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tattan Kinar.	..	..	72	2 0	37	1 8	47	1 14	58	4 1	52	4 0	51	4 4	47	4 12	56	3 8	62	2 8	..	..	69	2 10
Komiar ..	77	20 0	80	8 0	73	5 0	117	14 4	94	11 0	101	16 4	78	11 0	56	16 0	85	7 4	..	..	66	7 12	130	11 0
Nellimalai ..	34	5 7	36	2 2	30	2 4	23	2 4	21	2 12	23	5 0	24	3 4	31	6 8	..	..	..	..	..	..	..	..
Varadalampet.	73	8 10	60	3 3	..	..	61	3 2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Usoor, ..	72	6 0	80	16 0	63	13 8	68	12 1	63	13 5	73	25 0	52	26 0	71	33 0	62	9 8	72	15 0	66	15 8	76	16 0
Kylasagiri ..	49	2 11	44	6 0	46	6 8	40	6 3	40	10 9	45	15 4	46	8 0	41	18 8	46	10 8	..	..	..	..	..	..
Vellakal (Sholavaram).	47	5 1	50	6 4	42	5 0	29	4 1	35	10 8	54	11 4	36	5 10	32	13 8	52	5 2	62	9 8	62	15 4	36	7 0
Thellai ..	56	6 8	108	6 12	122	4 0	93	10 0	45	12 2	91	15 8	86	21 8	92	21 0	95	15 0	122	10 8	84	17 0	120	9 10
Santavasal Range.																								
Karungalthody.	60	5 14	70	2 12	82	4 5	68	3 0	42	17 11	65	15 0	..	..	{51 60}	{10 12 12 4}	..	..	{54 57}	{3 4 4 8}	59	7 12	62	7 4
Amerdi ..	21	58 1	18	21 0	15	20 2	14	32 4	15	70 1	15	55 0	21	53 0	20	53 0	20	15 0	31	50 0	12	75 0	20	33 0
Attuparai ..	70	5 0	43	5 0	48	3 2	..	..	57	2 9	..	..	{32 55}	{2 12 2 12}	50	3 0	64	2 0	61	12 0	26	2 4	60	2 10
Santavasal ..	38	1 0	44	10 0	34	6 2	34	4 8	57	6 0	58	15 0	45	24 0	46	14 8	43	12 4	44	17 4	44	6 8	30	6 0
Velam Kuppam.	23	1 2	20	2 4	..	..	..	..	..	..	..	..	{29 47 23}	{1 6 1 7 1 4}	29	18 2	..	..	24	8 4	22	15 0	28	14 0
Karnatigiri ..	56	12 0	..	..	52	4 2	61	3 4	65	7 4	61	13 12	50	20 0	52	14 0	69	8 2	42	10 0	66	15 0	58	8 6
Polur Range.																								
Tanjar ..	75	9 0	69	9 0	84	12 0	76	14 0	97	16 4	80	22 8	75	26 8	83	25 8	80	15 4	73	11 12	62	22 0	57	7 8
Periamalai ..	18	5 0	23	6 0	27	5 0	33	4 0	31	4 0	25	7 12	33	10 8	25	3 0	..	..	..	..	30	3 0	36	3 0
Pullimedu ..	30	6 6	28	5 12	27	5 12	32	4 8	38	4 8	23	9 8	15	10 4	27	13 10	30	11 8	34	7 8	20	11 0	28	6 0
Jambumalai ..	..	..	57	5 4	..	..	..	..	..	..	34	3 0	55	5 12	40	6 8	40	5 0	40	4 0	42	7 0	..	..
Tiruvannamalai Range.																								
Ponniar East.	..	..	119	4 8	82	4 8	65	7 0	103	7 4	161	7 0	58	9 0	85	7 0	109	11 4	83	10 0	108	4 0	89	7 2
Perungolathur Swamymalai.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	49	6 2	50	6 12	..	..	98	2 4	..	..

Statement showing prices obtained for fuel coupes—1923-24 to 1934-35—cont.

Year of felling.

Felling series (Palar Plantations).	1916–17. Area of coupe.	1916–17. Price per acre.	1917–18. Area of coupe.	1917–18. Price per acre.	1918–19. Area of coupe.	1918–19. Price per acre.	1919–20. Area of coupe.	1919–20. Price per acre.	1920–21. Area of coupe.	1920–21. Price per acre.	1921–22. Area of coupe.	1921–22. Price per acre.	1922–23. Area of coupe.	1922–23. Price per acre.	1923–24. Area of coupe.	1923–24. Price per acre.	1924–25. Area of coupe.	1924–25. Price per acre.	1925–26. Area of coupe.	1925–26. Price per acre.
	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS. A.
1 Virinjipuram	24	4 5	29	1 13	35	0 3	36	2 3	17	3 8	32	20 8	33	19 4	26	30 8	29	14 0	28	10 0
2 Chennur	{ 13 13 }	{ 0 11 0 6 }	..	..	..	..	26	0 6	..	..	{ 26 30 }	{ 3 14 7 12 }	25	10 0	35	20 0	25	17 0	27	12 0
3 Kilminal	24	4 9	23	19 2	23	40 0	..	..	14	8 15	13	23 1	13	2 14	13	79 8	15	29 0	27	15 0
4 Tiruvalam	21	2 8	21	26 3	24	20 6	34	60 4	31	10 10	34	7 8	33	10 8	19	7 4	25	3 2	26	17 0

	1926–27. Area	1926–27. Price	1927–28. Area	1927–28. Price	1928–29. Area	1928–29. Price	1929–30. Area	1929–30. Price	1930–31. Area	1930–31. Price	1931–32. Area	1931–32. Price	1932–33. Area	1932–33. Price	1933–34. Area	1933–34. Price	1934–35. Area	1934–35. Price
1 Virinjipuram	40	20 0	32	21 8	38	30 8	30	35 8	34	43 0	34	23 0	22	30 0	30	30 0	26	37 0
2 Chennur	No felling.																	
3 Kilminal	13	37 3	23	167 0	19	130 0	27	101 0	33	131 0	25	40 0	14	170 0	15	70 0	15	72 0
4 Tiruvalam	27	29 4	..	..	24	8 8	23	35 8	19	16 8	20	17 8	22	135 0	23	67 0	36	80 0

126. *Statement showing prices in rupees obtained for minor forest products—1925–26 to 1934–35.*

Ranges.

Items.	1925–26. Odagathur.	1925–26. Santavasal.	1925–26. Polur.	1925–26. Tiruvannamalai.	1926–27. Odagathur.	1926–27. Santavasal.	1926–27. Polur.	1926–27. Tiruvannamalai.	1927–28. Odagathur.	1927–28. Santavasal.	1927–28. Polur.	1927–28. Tiruvannamalai.	1928–29. Odagathur.	1928–29. Santavasal.	1928–29. Polur.	1928–29. Tiruvannamalai.	1929–30. Odagathur.	1929–30. Santavasal.	1929–30. Polur.	1929–30. Tiruvannamalai.
Avaram bark	415	281	286	..	415	150	150	1,015	415	505	400	1,353	..	168	133	1,353	300	168	133	1,353
Sural bark	..	230	250	..	75	135	..	165	50	55	50	..	55	65	..	..	61	70	110	50
Konnai bark	..	..	..	..	..	1,450	2,200	935	..	..	..	..	855	..	..	..	..	..	..	..
Nuxvomica	..	161	80	100	..	30	..	..	..	..	44	125	..	..	50	50	..	..	..	..
Other M. F. P.	1,338	4,066	1,152	1,905	1,913	1,900	971	1,250	1,408	4,931	1,412	1,930	1,866	4,571	3,404	3,095	1,241	4,412	2,589	2,380
Stone	900	..	..	..	900	..	..	..	900	..	..	..	3,010	..	..	..	..	..	..	..

Items.	1930–31. Odagathur.	1930–31. Santavasal.	1930–31. Polur.	1930–31. Tiruvannamalai.	1931–32. Odagathur.	1931–32. Santavasal.	1931–32. Polur.	1931–32. Tiruvannamalai.	1932–33. Odagathur.	1932–33. Santavasal.	1932–33. Polur.	1932–33. Tiruvannamalai.	1933–34. Odagathur.	1933–34. Santavasal.	1933–34. Polur.	1933–34. Tiruvannamalai.	1934–35. Odagathur.	1934–35. Santavasal.	1934–35. Polur.	1934–35. Tiruvannamalai.
Avaram bark	..	213	133	850	165	213	103	850	..	213	103	850	..	..	62	..	110	150	62	..
Sural bark	50	50	55	29	30	..	20	..	..	..	16	21	..	..	..	18	..	..	30	20
Konnai bark	..	..	..	..	..	..	..	..	..	..	..	..	..	534	410	..	400	..	..	..
Nuxvomica	..	..	..	60	..	..	..	25	..	..	..	21	..	..	..	20	..	..	..	23
Other M. F. P.	1,022	2,016	1,460	1,835	799	2,241	855	409	846	4,579	831	606	1,082	2,027	1,186	480	923	1,520	1,200	480
Stone	..	..	..	..	4,100	..	..	..	1,144	22	..	..	1,117	40	..	..	2,008	30	..	..

CHAPTER IV.—STAFF AND LABOUR SUPPLY.

127. *Staff, administrative, executive and protective.*—The administrative staff consists of one District Forest Officer, who is usually a Deputy Conservator of Forests. Details of the executive and protective staff, as it stands at present, is given in the following statement :—

Range.	Permanent establishment.			Temporary establishment.
	Rangers.	Foresters.	Forest guards.	Forest watchers.
(1)	(2)	(3)	(4)	(5)
Odagathur	1	6	25	23
Santavasal	1	3	11	11
Polur	1	4	10	10
Tiruvannamalai	1	1	8	8

128. *Staff, clerical*—

(*a*) *District Forest Office*—

Head clerk	..	1
Accountant	..	1
Routine clerks	..	5
Draftsman	..	1
Typist ..	..	1
Peons ..	..	4

(*b*) *Range Offices*—

Range.	Range clerks.		Peons.	
	Permanent.	Temporary.	Permanent.	Temporary
(1)	(2)	(3)	(4)	(5)
Odagathur	1	1	..	2
Santavasal	2	..	1	1
Tolur	2	..	1	1
iruvannamalai	1	..	1	..

129. *Labour supply.*—In the plains labour, though not plentiful, is adequate. In the Javadis the Malayalees constitute the entire labour force and under the terms of the 'Forest Village System' are bound to supply labour when called upon to do so—*vide* paragraph 39 (*a*) above. Hitherto no serious difficulty has been experienced in obtaining the requirements of the department.

130. A list of forest villages on the Javadi plateau is given in column 5 of the statement in paragraph 375 below.

CHAPTER V.—PAST SYSTEMS OF MANAGEMENT.

SECTION I.—GENERAL HISTORY OF THE FOREST.

131. *Introduction.*—The acquisition of the North Arcot district by the East India Company was completed on the 31st of July 1801, when Azim-ul-Umara, uncle and successor of the last Nabob of the Carnatic, handed over to the Company the whole of his civil and military authority and accepted in return a stipendiary allowance of one-fifth of its estimated revenue for the support of himself and his family.

132. *Period prior to the passing of the Madras Forest Act in* 1882.—The following extracts from Chapter XI, Volume II, of the 'Madras District Manuals', North Arcot, describe briefly the administration of the forests from the time they came under British control to the passing of the 'Madras Forest Act' in 1882, when matters were put on a regular footing and systematic reservation commenced.

133. "For long after the assumption of the district by the British no systematic control of the forests was attempted. Until 1844 the only tax upon timber was that collected as land customs by the Sayer (duties on imports and goods in transit) officials. When land customs were abolished, felling greatly increased, and became so indiscriminate that in 1846 the Collector, Mr. Lovell, directed that all jungles should be taken charge of by tahsildars and that no tree should be felled without their permission, which should only be given for such trees as the monigar of the village pronounced fit to be felled. A small tax was at the same time levied, but it was too low to keep the jungles from being recklessly thinned. The charge, for instance, for a cart-load of red sanders wood was only Re. 1, while in Cuddapah it was Rs. 6. The natural result was that red sanders almost disappeared, and that the Tirupati forests, in which alone it grew, were handed over to the Deputy Conservator of the Cuddapah district in 1861.

134. In the following year Mr. J. D. Robinson, the Collector, brought conservancy rules for the first time into operation, fixing new rates of seigniorage, and adopting what he styled the "Monigar Ranger and Yanadigilly" system. Village monigars collected the seigniorage, and retained 20 per cent of the receipts as the remuneration for themselves and their watchers.

135. In 1863 the Board of Revenue proposed that the Vellore and Polur jungles should be placed under a Deputy Conservator, as the Sub-Collector, Mr. Barlow, had no faith in village conservancy, and was convinced that many saplings were destroyed. Mr. Robinson strongly opposed the measure ; but in 1865 the Thellay and Arasambattu jungles were transferred to the Forest Department, and all the rest of the Vellore and Polur forests followed two years later. Previous to this, most of the best trees had been carried away for use upon the railway, while Mr. Sullivan was Sub-Collector and entrusted with the supply of sleepers to the company. The forests have not yet recovered from the terrible drain then imposed upon them."

136. *Period subsequent to the passing of the Madras Forest Act in* 1882.—Striking progress in the reservation of areas marked the commencement of this period. In 1884 three reserves, Ambur (including the fuel reserve and the plantation), Senur and Karnatigiri, aggregating 12,860 acres, were constituted reserve forests under section 16 of the Act. Further reservations proceeded briskly, until, in 1898, the total area of reserves amounted to 324,291 acres. By this time all the major reservations had been completed.

137. *Administrative changes.*—From 1865 to 1911 the North Arcot forest district corresponded in area and boundaries with the North Arcot revenue district and also had its headquarters at Chittoor. When the revenue district was bifurcated in 1911 into the North Arcot and Chittoor districts, the forest district was also bifurcated and similarly designated. The headquarters of the two forest districts were at Vellore and Chittoor. At the same time the Tiruvannamalai range was transferred to the North Arcot forest district from South Arcot. Later in the same year, 1911, the North Arcot forest district was further bifurcated into the North and South Vellore forest divisions, with the headquarters of both divisions at Vellore (G.O. No. 3387, Revenue, dated 13th November 1911).

138. On the 1st of April 1917, the South Vellore division was again further bifurcated into the South and West Vellore divisions, with headquarters at Vellore and Tiruppattur respectively, and the Pavanjiput reserve was transferred from the South Arcot forest district to the new South Vellore forest division (G.O. No. 1131, Revenue, dated 18th May 1916).

139. On the 1st of July 1920, the Gingee range was transferred from the East Salem division to South Vellore (G.O. No. 929, dated 14th May 1920) and, consequent upon the transfer of a large number of reserves to panchayat management, was amalgamated with the Tiruvannamalai range on the 1st of September 1925 (IV Circle Conservator's D. Dis. No. 819/25-M, dated 11th August 1925).

140. The Chingleput division, which was abolished on the 1st of May 1925, was, with the exception of the Sathivedu range, amalgamated with the North Vellore division (G.O. Ms. No. 746, Development, dated 19th May 1925). This amalgamation did not involve any increase in the area of reserved forests administered by the Forest Department as the reserves of the Chingleput division, excluding a few in the Sathevedu range, had already been handed over to panchayat management. The only extra work involved by the amalgamation was the adjustment of petty items of revenue realized by the Revenue department in the five taluks noted in Appendix I. This arrangement still continues.

141. On the 16th of July 1926, owing to the transfer of a large number of reserves to panchayat management, and also for financial reasons, the North, South and West Vellore divisions were amalgamated into one division with its headquarters at Vellore (G.O. Ms. No. 789, Development, dated 31st May 1926). At the same time, the Krishnagiri and Gudiyattam ranges, of the West and North Vellore divisions respectively, were transferred to North Salem and Chittoor. The single division continued for about six and a half years, during which period it became evident that the division was unwieldy and too much for one District Forest Officer to administer.

142. Consequently, on the 1st of December 1932 the Vellore division was bifurcated into the East and West Vellore divisions, with headquarters at Vellore and Tiruppattur respectively (G.O. Ms. No. 1537, Development, dated 29th November 1932). The Krishnagiri range was transferred to West Vellore with effect from the 1st of June 1933 (G.O. Ms. No. 489, Development, dated 27th April 1933), but the Gudiyattam range remained a part of the Chittoor division.

143. *Working Plans.*—The original survey of the forests of the North Arcot division was completed in 1899. The first working plan was written by Mr. H. B. Bryant in 1901 and included the Sanankuppam, Ambur and Ambur Fuel reserves, aggregating 52,211 acres. Following this, several other working plans were written, each either covering a

group of reserves or prescribing for the exploitation of one or more particular products. The following statement gives a list of working plans prepared and sanctioned up to the present.

144.

Serial number and Working Plan for (1)	Sanctioned in (2)	Reserve. (3)	Area covered. Acs. (4)	Produce. (5)
1 The Ambur Forests, by H. B. Bryant.	B.P. Forest No. 251, dated, 15th July 1901.	Shanankuppam. Ambur. Ambur Fuel.	52,211	Timber, fuel and minor forest produce.
2 Do.	B.P. Forest No. 17, dated 9th January 1902, amended in B.P. Forest No. 265, dated 18th September 1902.	Do.	52,211	Bamboos.
* 3 The Tiruvannamalai Forests, by C. H. Maduranayakam Pillai.	B.P. Forest No. 155, dated 22nd May 1902.	Perungolathur Swamimalai. Valasamalai. Nattamalli. Ponniar (part).	45,767	Small timber, fuel, manure leaves and grazing.
4 The Galamalai and Asanampet Hills and Shanankuppam Reserve, by V. S. Gurunatha Pillai (supplemental to No. 1 above).	B.P. Forest No. 146, dated 26th July 1904.	Shanankuppam. Ambur.	25,435	All produce except sandal and bamboos.
* 5 The Vellore Forests, by V. S. Gurunatha Pillai.	B.P. Forest No. 223, dated 8th November 1904, amended in B.P. Rout. No. 501, dated 22nd June 1915.	Athiyur. Nellimalai. Kylasagiri. Appukallu. Karuthamalai. Arasampattu. Thellai. Puthur. Veerappanur.	85,784	All produce except sandal.
* 6 The Polur Range, by V. S. Gurunatha Pillai (now the Polur and Santavasal ranges).	1905 (The B.P. number and date are not forthcoming).	Puthur. Thellai. Veerappanur. Malayalam. Karnatigur. Patrakad. Santavasal. Mulakad. Periamalai.	135,712	All produce.
* 7 The Polur Range, by J. S. Battie, (revision of No. 6 above).	B.P. Forest No. 202, dated 14th October 1907, amended in B.P. Rout. No. 501, dated 22nd June 1915.	Do.	135,712	Do.
* 8 The East Vellore Range, by V. S. Gurunatha Pillai.	B.P. Forest No. 20, dated 20th January 1910.	Banavaram	1,210	Fodder grass (removals by Military Grass Farms only).
* 9 The Javadi and Yelagiri Hills, by C. C. Wilson.	B.P. Forest No. 172, dated 13th December 1915.	Veerappanur, Mulakad. Patrakad. Malayalam. Puthur. Arasampet Thellai.	55,447	Sandalwood.
10 The Palar Reverside Plantations, by T. N. Hersey.	B.P. Forest No. 107, dated 13th July 1916.	Virinjipuram. Vikramachi. Ammundi. Chenur. Kilminal. Tiruvallam. Vannivedu.	1,388	Small timber, fuel and fodder grass.
11 South Vellore, by K. R. Venkataramana Ayyar.	C.C.P. No. 3, dated 22nd January 1920.	Arasampattu. Puthur. Thellai. Malayalam. Santavasal. Veerappanur. Patrakad. Mulakad. Valasamalai. Nattampalli. Perungolathur Swamimalai.	105,932	Bamboos and minor forest produce.
* 12 South Vellore by H. W. A. Gaudoin.	C.C.P. No. 114, dated 6th May 1925.	All reserves in the Polur Santavasal and Tiruvannamalai ranges.	307,016	All produce except sandal.

* These working plans also included a number of reserves which are now situated in other divisions, or have either been disafforested or handed over to Panchayat management.

SECTION 2.—PAST SYSTEMS OF MANAGEMENT AND THEIR RESULTS.

Sandal.

(*a*) Prior to the last working plan.

145. There is no record of any sandal operations in these forests prior to 1900. During the years 1900 to 1903 a sum of Rs. 800 was realized by the sale of sandalwood extracted departmentally. The first working plan relating to sandal was written by Mr. V. S. Gurunatha Pillai in 1905 and revised by Mr. J. S. Batty in 1907 in as far as it related to the Javadis of the North Arcot district. The plan prescribed for the extraction, in the Polur and Santavasal ranges (the then Polur range), of such trees as were dead or dying or were of a minimum girth of 36 inches at 4 feet from the ground. Little or no attention was paid to cultural operations and regeneration. These prescriptions remained in force until Mr. C. C. Wilson's working plan for the Javadi and Yelagiri Hills, according to which work is at present regulated, came into operation in 1915. In the Odagathur and Tiruvannamalai ranges sandal occurs either scattered or in small patches and up to a few years ago was not considered sufficiently important to justify systematic working.

(*b*) Mr. C. C. Wilson's Plan.

146. The following paragraphs briefly set forth the more important prescriptions of Mr. Wilson's plan, the extent of their application and the results obtained.

147. *Method of treatment and subdivision of the area.*—As far as the present East Vellore division is concerned, Mr. Wilson's plan dealt with the Polur and Santavasal ranges only. It prescribed improvement felling involving the extraction of dead and dying trees on a six-year felling cycle. The sandal bearing areas of each range, including poramboke and patta lands formed a working circle, which was divided into three felling series of six coupes each. In practice this amounted to one working circle of six felling series as the method of treatment was the same in both ranges. Thus, six coupes were worked annually. Their size varied from 669 acres to 3,056 acres, depending on the density of the stocking. The following statement shows the subdivision of the area :—

Santavasal Range.

Felling Series.		Coupes.		
Name and composition.	Area.	Number.	Area.	Year of felling.
(1)	(2)	(3)	(4)	(5)
	ACS.		ACS.	
Thongamalai—				
Thongamalai enclosure.	3,667	I	1,627	1915–16 1921–22 1927–28
Puthur Reserve Forest (part).	1,753	II	1,705	1916–17 1922–23 1928–29
Arasampattu Reserve Forest.	2,575	III	1,219	1917–18 1923–24 1929–30
		IV	1,411	1918–19 1924–25 1930–31
		V	904	1919–20 1925–26 1931–32
		VI	1,129	1920–21 1926–27 1932–33
Total ..	**7,995**		**7,995**	
Amerdi—				
Tellai Reserve Forest (part).	3,086	I	1,597	1915–16 1921–22 1927–28
Puthur Reserve Forest (part).	4,542	II	1,505	1916–17 1922–23 1928–29
Amerdi plantation.	26	III	1,770	1917–18 1923–24 1929–30
		IV	848	1918–19 1924–25 1930–31
		V	866	1919–20 1925–26 1931–32
		VI	1,068	1920–21 1926–27 1932–33
Total ..	**7,654**		**7,654**	

Polur Range.

Felling Series.		Coupes.		
Name and composition.	Area.	Number.	Area.	Year of felling.
(6)	(7)	(8)	(9)	(10)
	ACS.		ACS.	
Veerappanur—				
Veerappanur Reserve Forest (part).	8,169	I	1,668	1915–16 1921–22 1927–28
		II	948	1916–17 1922–23 1928–29
		III	726	1917–18 1923–24 1929–30
		IV	749	1918–19 1924–25 1930–31
		V	2,208	1919–20 1925–26 1931–32
		VI	1,870	1920–21 1926–27 1932–33
Total ..	**8,169**		**8,169**	
Patrakod—				
Patrakad Reserve Forest.	10,327	I	1,861	1915–16 1921–22 1927–28
Mulakad Reserve Forest.	1,625	II	1,947	1916–17 1922–23 1928–29
		III	1,858	1917–18 1923–24 1929–30
		IV	2,481	1918–19 1924–25 1930–31
		V	2,413	1919–20 1925–26 1931–32
		VI	1,392	1920–21 1926–27 1932–33
Total ..	**11,952**		**11,952**	

Santavasai Range.

Felling Series.		Coupes.		
Name and composition.	Area.	Number.	Area	Year of felling.
(1)	(2)	(3)	(4)	(5)
	ACS.		ACS.	
Nadanur—				
Puthur Reserve Forest (part).	7,413	I	882	1915–16 1921–22 1927–28
Malayalam Reserve Forest.	1,303	II	837	1916–17 1922–23 1928–29
Tellai Reserve Forest (part).	122	III	1,585	1917–18 1923–24 1929–30
		IV	2,284	1918–19 1924–25 1930–31
		V	1,947	1919–20 1925–26 1931–32
		VI	1,303	1920–21 1926–27 1932–33
Total ..	8,838		8,838	

Polur Range.

Felling Series.		Coupes.		
Name and composition.	Area.	Number.	Area.	Year of felling.
(6)	(7)	(8)	(9)	(10)
	ACS.		ACS.	
Komittiyur—				
Komittiyur enclosure.	5,781	I	3,056	1915–16 1921–22 1927–28
Veerappanur Reserve Forest (part).	5,058	II	2,689	1916–17 1922–23 1928–29
		III	1,436	1917–18 1923–24 1929–30
		IV	669	1918–19 1924–25 1930–31
		V	1,828	1919–20 1925–26 1931–32
		VI	1,161	1920–21 1926–27 1932–33
Total ..	10,839		10,839	

148. *Fellings* were prescribed for three cycles covering a period of 18 years, 1915–16 to 1932–33. In 1917–18 no felling was done as extraction was confined to a number of trees which were blown over in a severe cyclone in the previous year. Thus the third cycle of the plan was not completed until 1933–34. During 1934–35 and 1935–36 fellings were continued in coupes I and II of each series in accordance with the prescriptions, pending revision of the plan.

149. *Extraction.*—It was prescribed that dead trees were to be removed in the year of felling, and dying trees girdled and left to die and dry for two years before being extracted. That part of the prescription relating to girdling was not sanctioned and the extraction of dying trees was discontinued from 1928–29 under the orders of the Chief Conservator of Forests in accordance with Resolution III of the Proceedings of the Conservators' Conference held in June 1927 (C.C.P. No. 230/27, Press, dated 13th July 1927).

150. *Tending* was prescribed in each coupe in the year following that of felling and was carried out accordingly up to 1922. In 1922, during the tour of the Commissioner of Land Revenue and the Conservator of Forests, Salem Circle, in the Javadis, the "Malayalees" represented that they were too often disturbed in their agricultural pursuits by the frequent demands for labour made upon them by the Forest Department for sandalwood operations. After due consideration it was decided to carry out the tending simultaneously with the operation of marking and enumerating dead trees for extraction, i.e., tending was done in the year preceding that of felling. The deviation was sanctioned by the Chief Conservator of Forests in his Proceedings Rout. No. 19, dated 10th January 1923.

151. The tending consisted of freeing crowns of sandal trees and their hosts from creepers, cutting down trees interfering with the free development of sandal and helping sandal saplings by cutting back growth interfering with them. A rate of 6 pies per acre was fixed for the operation, but in recent years, owing to financial stringency, it was considered necessary to halve this rate.

152. The Chief Conservator of Forests, in his Proceedings No. 262, dated 20th July 1929, reduced the tending cycle from six to three years. This deviation was however not put into practice, again because of financial stringency, and tending has been done throughout as prescribed in the plan.

153. In addition to this general tending it was prescribed that *specially protected blocks* from 25 to 100 acres in extent, and containing particularly promising growth of young sandal, were to be selected in each of the annual coupes and rigidly protected from fire and grazing. These specially protected blocks were to be tended and watched until the young sandal growth was out of danger of suppression. It was assumed that this tending would not continue for more than the length of the felling cycle. Unfortunately, except in a few cases, the selection of blocks was not done as the working plan intended. Areas containing well established sandal trees were unnecessarily fenced and protected and the tending done in them was in no way different to the general tending carried out over the whole area. Experience showed that it was difficult to find a block of the size prescribed in the plan, 25 to 100 acres, containing young growth throughout, and that the efficient fencing of a block of this size was an expensive business. In 1929, therefore, it was decided to limit the size of each block to 10 acres (Chief Conservator of Forests, Ref. No. 9151 C-2/29-1, dated 10th December 1929). Later, owing to financial stringency, further selection and tending of these specially protected blocks was held in abeyance.

154. Under *regeneration* it was prescribed that—

(i) immediately a coupe was felled, a cleaning should be done under all specially promising seed bearers, the soil raked up around them and all seedlings freed from interfering growth.

(ii) Sowings were to be done in small blanks wherever they occurred.

(iii) Thereafter the coupe was to be gone over annually for the next three years and young sandal kept clear of overhead and too much lateral shade.

155. *Cleaning* under specially promising seed bearers appears to have been done until 1922, but there is no record to show the extent to which this prescription was caried out. Writing in 1921, Mr. H. A. Latham, Conservator of Forests, records: "Fencing mother trees is to be stopped as, so far, practically no results have been seen which justify the labour involved." Again, in 1922, Mr. Latham records "Mother trees are a waste of labour." From this date the prescription was discontinued, although no sanction seems to have been obtained for the deviation.

156. *Sowing in blanks* was done annually until 1922. From 1922 to 1927 no sowing was done. The reason for this is not known, but it is probable that the operation was discontinued along with the cleaning under specially promising seed bearers. In 1927 it was ordered that each subordinate should produce at least one acre of established sandal in his beat annually and from that year no expenditure was incurred on the operation. Unfortunately the blanks which were sown were not marked and it is impossible at this stage to comment on the results obtained. The control journals indicate that sowing done by subordinates, after 1927, was generally unsuccessful. The following statement shows the areas gone over each year. The areas of the blanks have not been recorded.

Year.	Santavasal Range.			Polur Range.		
	Area gone over.	Locality.	Cost.	Area gone over.	Locality.	Cost.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	ACS.		RS. A. P.	ACS.		RS. A. P.
1916-17 ..	995 81	Coupe I. each series Coupe II, Thongamalai series.	46 0 0	3,166 634	Coupe I, each series Coupe II, each series	150 0 0
1917-18 ..	3,770	Not known	Not known.	Nil.	Nil.	Nil.
1918-19 ..	2,565	Coupes I to III, each series.	83 13 0	1,396	Coupes I to III, each series.	* 10 6 0
1919-20 ..	3,831	Not known	62 11 3	Not known.	† S. P.Bs. in Coupes I to III, each series.	* Nil.
1920-21 ..	2,159	Not known	33 10 0	1,354	Coupes III to V, each series.	20 8 6
1921-22 ..	670	Not known	20 15 0	3,445	Coupes IV to VI, each series.	* 98 4 6
		Note.—From 1927-28 no expenditure was incurred.				
1927-28 ..	Nil.	Nil		Not known.	S.P.Bs. in Veerappanur, Patrakad and Komattiyur series.	
1928-29 ..	265	† S.P.Bs. in Coupes I to VI Thongamalai series.		102	S.P.Bs. in Coupes I to VI Komattiyur series.	
	240	S.P.Bs. in Coupes I to VI Amerdi series.		60	S.P.Bs. in Coupes I to V Patrakad series.	
	224	Coupees I to VI Nadanur series including S.P.Bs.		142	S.P.Bs. in Coupes I to VI Veerappanur series.	
1929-30 ..	1,100	Coupes I, II and VI, Thongamalai series including S. P.Bs.		170	S.P.Bs. in Coupes I to VI, Veerappanur series.	
	107	Coupes I, II and VI, Amerdi series including S.P.Bs.		213	S.P..Bs. in Coupes I to VI, Patrakad series.	
	110	Coupes I to VI, Nadanur series including S. P.Bs.		188	S.P.Bs. in Coupes I to VI, Komattiyur series.	
1930-31 ..	672·4	Coupes I to VI, Thongamalai series including S.P.B's.		70	S.P.Bs. in Veerappanur series.	
	231	Coupes I to VI, Amerdi series including S.P.Bs.		31	S.P.Bs. in Patrakad series.	
	337	Coupes I to VI, Nadanur series including S.P.Bs.		80	S.P.Bs. in Komattiyur series.	
1931-32 ..	1,888	Coupes I to VI, Thongamalai series including S.P.Bs.		30	S.P-Bs. in Veerappanur series.	
	211·4	Coupes III to V, Amerdi series including S.P.Bs.		35	S.P.Bs. in Patrakad series.	
	214	Coupes I to VI, Nadanur series including S.P.Bs.		38	S.P-Bs. in Komattiyur series.	
1932-33 ..	Not known (2,455 patches).	Coupes I to VI, Thongamalai series including S.P.Bs.	..	Not recorded.		
	Not known (3,000 patches).	Coupes I to VI, Amerdi series including S.P.Bs.				
	Not known	Coupes I to VI, Nadanur series including S.P.Bs.				

* All or some of the work done free of cost.
† S.P.=B.Specially protected block (paragraph 37 of Mr. Wilson's Sandalwood Working Plan).

Year. (1)	Santavasal Range. Area gone over. (2) ACS.	Locality. (3)	Cost. (4) RS. A. P.	Polur Range. Area gone over. (5) ACS.	Locality. (6)	Cost. (7) RS. A. P.
1933-34 ..	Not known (2,400 patches + 3 acres).	Coupes I to VI, Thongamalai series including S.P.Bs.		7	Regeneration plots in Coupe III, Veerappanur series.	
	Not known (2,400 patches + 1 acre).	Coupes I to VI Amerdi series including S.P.Bs.		2,422	Coupe V, S.P.B's and regeneration plots in Coupe III, Patrakad series.	
	Not known (600 patches + 2 acres).	Coupes IV and V, Nadanur series including S.P.Bs.		3,540	Coupe I, Komattiyur series.	

157. In addition to the above, sandal seed was sown in patches under shrubs and along stream banks in the undermentioned localities outside the Sandalwood Working Plan area. Here again patches were not marked and it is not possible to state what the results are, except in the cases of the Thaniar and Nadanur rest-house compounds, where the sandal has established itself. At Nadanur, however, there is a serious deficiency of hosts.

Year. (1)	Santavasal Range. Area gone through. (2)	Locality. (3)	Polur Range. Area gone through. (4)	Locality. (5)
1927-28 ..	4	Attuparai fuel series, Coupe III .. Santavasal fuel series, Coupe IV .. Karnatigur fuel series, coupes I and III.	Not recorded.	Worked fuel coupes and Thaniar rest-house compound.
1928-29 ..	80	Arasampet Reserve	16	Moolakad Reserve.
	120	Malayalam Reserve		Pullimedu fuel series, Coupe I.
	2	Nadanur rest-house compound ..		Thaniar fuel series, Coupe V.
1929-30 ..	Nil.	....	13	Veerappanur Reserve.
1933-34 ..	Not recorded.	Nadanur rest-hourse compund ..	Nil.	

158. *The more important results achieved by Mr. Wilson's Working Plan* may be summarized under three heads, viz :—

(i) A very considerable increase in the area of the sandal forest, which, it is not unreasonable to assume, is due to an increase in the number of seed bearers in the higher girth classes, brought about by the discontinuance of the extraction of healthy trees of 36 inches in girth and over. That mature trees were markedly deficient when Mr. Wilson carried out his enumeration in 1915 is evident from the fact that over an area of 53,547 acres, only 1,945 trees (an average of 1 tree for every 28 acres) of 36 inches in girth and over were measured. Again, in paragraph 30 of his plan Mr. Wilson records : "When Mr. Rama Rao prepared his preliminary working plan for Tiruppattur range, then in Salem district (now in the West Vellore division) he raised the minimum felling girth by 6 inches and clearly proved when he did so that the lower girth at which felling had taken place previous to the preparation of his plan had resulted in considerable loss of revenue. From a perusal of his remarks on the subject it is evident that he was not at all confident that even his higher minimum would be sufficient, and this is without doubt the case, though what the correct figure may be we are not in a position to say even now owing to the lack of mature trees in the forest, already referred to."

A complete enumeration of the sandal bearing areas carried out during 1934 and 1935 shows that the species has extended 23·4 per cent by area, since 1915.

(ii) The establishment of systematic working whereby the whole of the sandal bearing area of the division is gone over once in six years and all dead trees extracted before they depreciate in value or are lost sight of.

(iii) The production of a 'Sandalwood Register' in which the girth of every tree extracted is recorded with its corresponding yield of heartwood. This register serves the purpose of showing definitely that there is no relation whatsoever between the girth of a sandalwood tree and the quantity of heartwood it yields, hitherto a doubtful point in some quarters.

Timber.

159. A brief description of the manner in which timber was extracted prior to the passing of the Madras Forest Act in 1882 is to be found in paragraphs 132 to 135 above.

160. When the first working plan, for a part of the present Odagathur range, was written in 1901 the forest had already been drained of large timber for the supply of sleepers to the Madras Railway and the plan only contemplated the supply of small timber for

agricultural purposes from fuel coupes worked on the simple coppice system on a 25 year rotation. In 1904, under the prescriptions of another plan, timber working circles were formed for practically the whole of the Odagathur range, the method of treatment being selection cum improvement on a 20 year felling cycle. All trees 4 feet and over in girth at breast height, all dead and dying trees and trees interfering with superior growth were extracted.

161. In the Santavasal, Polur and Tiruvannamalai ranges a small quantity of timber was worked departmentally in 1892. In 1897 contractors were allowed to fell marked trees and remove them on permits issued by Range Officers. Contracts for dead wood were also in force. In 1905 the first working circles were formed, the method of treatment being selection cum-improvement as briefly described in the preceding paragraph.

162. Thus, by 1905, the so called 'timber' forests were brought under the selection cum improvement system throughout the division, but the prescriptions practically remained a dead letter as the small quantity of timber which remained was so poor that it did not justify the adoption of a separate method of treatment and could be worked most conveniently along with fuel, as small timber for agricultural and domestic purposes, under the simple coppice system. Accordingly, in 1915, Mr. P. M. Lushington, Conservator of Forests, of the then Southern Circle, addressed the Board of Revenue and had the prescriptions of all existing working plans cancelled in as far as they related to timber working circles. (B.P. Forest No. 664-Mis dated 23rd October 1915.)

163. In 1925, Mr. H. W. A. Gaudoin in his Working Plan, which has not yet been formally cancelled, prescribed a Timber Working Circle of eleven felling series, three in each of the Santavasal and Polur ranges and five in Tiruvannamalai. Of these, one in Polur and three in Tiruvannamalai have since passed into panchayat control. The felling series comprised the steeper slopes of the Javadi and other hills, above the limits of the fuel felling series where the species are suitable for providing the ryots with small timber for agricultural and domestic purposes.

164. In each felling series a coupe, varying in size according to the demand and condition of the growth, but limited to one-ninth the area of the series, was to be laid out, with natural boundaries as far as possible, and worked each year. Ryots requiring timber for bona fide agricultural and domestic purposes were permitted to fell timber within the coupe of the year on specified days on payment to the Range Officer of a nominal rate fixed for each description of implement or building timber. Applications for their requirements were to be made by the ryots so as to reach the Range Officer during the first week of every month. Fellings were to be carried out in the presence of an officer not below the rank of forester.

165. There is not a single instance on record where the ryots took advantage of the system. Their requirements were obtained from fuel coupes and by illicit removals.

166. In the Odagathur range work is at present controlled by a tentative scheme which provides for the supply of small timber from fuel coupes. The system is simple coppice in the poorer areas and coppice with standards where the existing growth justifies the retention of standards.

Bamboos.

(*a*) Prior to the latest working plans.

167. The first bamboo working plan was written by Mr. H. B. Bryant in 1902. Before that date it was customary to lease out the right to remove bamboos from the whole forest annually, with the result that easily accessible areas were grossly overworked. Mr. Bryant's Working Plan dealt with a part of the present Odagathur range and prescribed a rotation of three years. The rules regulating felling were practically the same as those in force to-day. In 1904 the remaining portion of the Odagathur range and parts of Santavasal and Polur were also brought under systematic working on a three-year rotation. The subdivision of the area into working circles, felling series and coupes was revised in 1907 and at about the same time the system of triennial leases was introduced.

(*b*) The latest working plans.

168. In 1919 it became necessary to revise the then existing working plans because it was found that the stocking in the coupes bore no proportion to their areas and that the size of the coupes was unmanageably large. The revision with reference to the Santavasal, Polur and Tiruvannamalai ranges (the Odagathur range was then not a part of the East Vellore division) was done by Mr. K. R. Venkataramana Ayyar in his Working Plan (C.C.P. No. 3, dated 22nd January 1920), which was subsequently incorporated in Mr. H. W. A. Gaudon's Working Plan (C.C.P. No. 114, Press, dated 6th May 1925), according to which work is at present regulated.

169. The old working plans for the bamboo areas of the Odagathur range were revised in a tentative scheme sanctioned by the Conservator of Forests, IV Circle, in his D. Dis. No. 624/25-C, dated 20th October 1925. The scheme is still in force.

170. *Method of treatment and subdivision of the area.*—As bamboo working in the division is regulated by two separate plans there are two working circles, one comprising the bamboo areas of the Santavasal, Polur and Tiruvannamalai ranges and the other those of the Odagathur range. The rotation in both working circles is three years and the felling rules are practically the same. The system of triennial leases has been continued.

171. The bamboo areas of the Santavasal, Polur and Tiruvannamalai ranges were divided into nine blocks, each of which is worked through one chief outlet. The blocks were divided into twenty-six felling series according to labour conditions and working facilities. In the Odagathur range eight felling series were prescribed: no blocks were formed. As far as possible coupe and series boundaries followed natural features. The following statement sets forth the subdivision of the area :—

Range.	Name of block and area.	Felling series. Name	Area	Composition. Reserve.	Area.
(1)	(2)	(3)	(4)	(5)	(6)
			ACS.		ACS.
Odagathur		Athiyur	8,426	Kylasagiri	2,534
				Athiyur	4,738
				Arasampattu	1,154
		Thellai	10,656	Thellai	6,922
				Arasampattu	3,734
		Kottur	7,390	Do.	7,390
		Karuthamalai	16,320	Karuthamalai	16,320
		Asanampattu	8,568	Ambur	8,568
		Vellakal	10,489	Do.	5,452
				Vellakal	5,037
		Panangatteri	5,221	Ambur	5,221
		Naikaneri	13,896	Do.	11,925
				Shanankuppam	1,971
Santavasal	Odagathur, 16,283 acres.	Thongamalai	4,378	Thellai	1,514
				Puthur	2,864
		Nayakanur	4,360	Arasampattu	4,360
		Kudigam	3,489	Puthur	2,964
				Arasampattu	525
		Komiar	4,056	Do.	4,056
	Amerdi, 13,598 acres	Nekkini	3,900	Thellai	3,268
				Puthur	632
		Sathampattu	2,945	Thellai	960
				Puthur	960
				Malayalam	1,025
		Kanamalai	1,803	Do.	1,803
		Nadanur	4,950	Puthur	4,421
				Malayalam	529
	Shembakatope hill, 7,831 acres.	Puliyamkuppam.	3,989	Do.	3,989
		Benganur	3,842	Do.	3,842
	Shenbakatope plains, 10,098. acres.	Shembakatope	6,118	Do.	6,118
		Santavasal	3,980	Santavasal	3,980
Polur	Arasampattu, 12,566 acres.	Pudupattu	5,054	Veerappanur	3,206
				Arasampattu	1,848
		Veerappanur	4,607	Veerappanur	4,607
		Mandaparai	2,905	Do.	2,905
	Komattiyur, 12,425 acres.	Palankottai	7,514	Do.	7,514
		Tekamarathur	2,416	Do.	2,416
		Motlapattu	2,495	Do.	2,495
	Chillimalai, 9,150 acres.	Odamangalam	3,810	Patrakad	3,810
		Kuttakarai	5,340	Do.	4,252
				Mulakad	1,088
	Nababupalayam, 12,980 acres.	Kondikallur	5,362	Patrakad	2,210
				Mulakad	3,152
		Vedatope	2,880	Patrakad	2,880
		Pelavadi	4,738	Do.	4,738
Tiruvannamalai	Kalroyan, 10,971 acres.	Valasamalai	4,750	Valasamalai	4,750
		Nathampalli	3,595	Nathampalli	3,595
		Perungolathur-swamimalai.	2,626	Perungolathur-swamimalai.	2,626

172. The following five important *felling rules* were prescribed and the Malayalees (in the case of the Javadi hill reserves) made responsible, jointly with the lessee of each felling series, for seeing that they are strictly observed :—

(i) Felling should be confined to the coupe of the year.

(ii) The current years culms should not be cut.

(iii) The removal of 'picottah' bamboos (mature straight culms of *Dendrocalamus strictus* with the rhizomes intact) for bona fide local consumption should be confined to an area of 100 acres in the coupe of the year in one felling series of each range under such restrictions as may be considered necessary by the District Forest Officer.

(iv) Culms should not be cut on the outside of the clump only, but should be removed in such a way that the culms left standing are evenly distributed.

(v) Culms should not be cut less than one foot or more than two feet from the ground.

173. *Results of past working* reveal that the felling rules have been generally disregarded. Contractors and their agents seldom, if ever, enter the coupe. The rates paid to coolies for collection are so poor that it is almost impossible for a man to earn a living wage unless he goes to the forest nearest his village, irrespective of whether it lies in the year's coupe or not, and removes from it as many culms as he possibly can in the quickest and easiest manner. Consequently areas in the vicinity of villages have been grossly overworked. Whole clumps have been felled and culms, including those of the current year, cut at a height of anything from 4 to 15 feet from the ground. In addition to this most unsatisfactory state of affairs the Malayalees are responsible for the wholesale hacking of *Dendrocalamus strictus* for fodder, throughout the area, and for the removal of tender culms for basket making.

174. As prescribed, the right to fell and remove bamboos in each block or felling series is being sold in auction on a *triennial lease* beginning with the 1st April in each period. In the Santavasal, Polur and Tiruvannamalai ranges the unit of sale is a block comprising two or more felling series, while in the Odagathur range each felling series is sold separately.

175. As stated in paragraph 167 above, the system of *triennial leases* was introduced in about 1907 and has been continued since. The system originated with the idea of helping contractors in the matter of organizing labour, in making and recovering advances to and from coolies and in the construction and improvement of extraction roads. Naturally the system commands better prices than annual sales would as, in addition to working facilities afforded them, contractors are more independent of market fluctuations and consequently in a position to bid higher prices.

176. Reversion to annual leases has been contemplated from time to time but not seriously considered. Breach of felling rules is seldom due to ignorance, but to a desire on the part of the individual coolie to remove bamboo by the easiest and quickest method in order to earn a living wage. As long as this condition continues it is very doubtful as to whether reversion to annual sales would set matters right, for we will still be faced with the difficulty of confining the activities of an underpaid and discontented labour force to the coupe of the year—by no means an easy task when one considers that the average size of a bamboo coupe is anything over 1,500 acres and that supervision of bamboo extraction is only one of the many duties of a forest guard.

177. Contractors have been fined for breach of felling rules from time to time and deductions have been made from refunds of grazing revenue to Malayalees. It is however evident that the action taken has had little or no effect on the offenders and the damage still continues.

Fuel.

(*a*) Prior to the latest working plans.

178. The only record of early working which can now be traced is to be found in the settlement records and relates to the Tiruvannamalai taluk, then a part of the South Arcot district. It is summarized in the two following paragraphs.

179. In 1830 a lease was granted by Government to Mr. Heath to cut and remove fuel for 21 years in the South Arcot district on payment of the following royalty :—

	RS.
First period of five years	Free.
Second period of five years	500
Third period of five years	1,000
Last six years	1,500

The lease expired in 1851.

180. In 1853 an iron company was formed, and a lease for thirty years was granted, giving the company exclusive right of mining iron ore from the waste lands in several districts, South Arcot included. Operations commenced in the Tiruvannamalai taluk and a rate of five annas per cart-load was levied on the fuel consumed by the iron company. Most of the forests in the taluk, and certainly all those within a 15-mile radius of the town of Tiruvannamalai, were worked for this fuel supply. The operations of the company were virtually terminated in 1867 and the conservancy of Government lands was thenceforth maintained by the Forest department.

181. In the Odagathur, Santavasal and Polur ranges large areas appear to have been leased out annually, little or no attention being paid to silvicultural regulations.

182. The first working plans which prescribed systematic working were written by Mr. H. B. Bryant in 1901 for the Ambur, Shanankuppum, Ambur Fuel and Vellakal reserves of the Odagathur range, aggregating 52,211 acres, and by Mr. C. H. Maduranayakam Pillai in 1902 for the reserves of the Tiruvannamalai range. Both these plans prescribed simple coppice on a 25-year rotation, leaving standing a few trees which either afforded good shade or were valuable for the minor forest produce they yielded.

183. In paragraph 13 of his plan Mr. Bryant records " . . . . (the forest) was open to anyone who chose to come and cut; then it was supposed to be protected by village conservancy, and during this period it was that the forest was almost entirely denuded of all its timber trees for sleepers for the Madras Railway, and subsequent to this it has been drained and drained for supplying the Madras Railway with engine fuel and too little regard has been paid to seeing that the fellings have been executed in accordance with silvicultural principles with the result that, instead of the growing stock improving in appearance after being felled over, it has very much deteriorated and a few more years at the present rate of fellings will necessitate a long period of rest before the forest can become legitimately ripe for the axe again. As stated already in the introduction, it can serve no useful purpose here to discuss the past methods of treatment. The appearance of the forest speaks for itself. It has undoubtedly been overworked and is being still with a view to supplying the Madras Railway with engine fuel. At the present rate of supply the forest has only sufficient for a few years more and it rests with the Conservator to decide whether the fellings shall continue to be so extensive as they are now or whether they shall at once be curtailed to the limit proposed in this working plan . . . ".

184. In 1904 Mr. Gurunatha Pillai wrote a supplemental working plan for a further area of 25,305 acres in the Odagathur range and prescribed coppice with standards on a 25-year rotation. In the same year he wrote another plan for an area of 97,157 acres in the Odagathur, Santavasal and Polur ranges, and in 1905 a third plan for the remainder of Santavasal and Polur. In both the latter plans, which were revised by Mr. J. S. Battie in 1907, in so far as the Santavasal and Polur ranges were concerned, the method of treatment was coppice with standards on a 30-year rotation.

185. In 1916, owing to the classification of reserves and the inclusion of many unworkable areas, in some cases whole coupes lying on hill tops, the prescriptions of the then existing working plans became impossible to work and in anticipation of the complete revision of all the old fuel working plans the Board of Revenue, at the instance of the Conservator, sanctioned a 6-year programme of working for all fuel forests on a 30-year rotation (B.P. No. 1371, dated 13th October 1916). The scheme continued until 1921–22 when the whole question of fuel working was examined. It was then found that many unworkable areas were still included in coupes, that the size of the coupes was in some cases too large and that it was desirable to increase the rotation to forty years. As a result Mr. H. W. A. Gaudoin wrote his working plan for the Santavasal, Polur and Tiruvannamalai ranges (C.C.P. No. 114, Press, dated 6th May 1925) and Mr. E. K. Krishnan a tentative scheme for Odagathur (IV Circle Conservator's D.Dis. No. 625/25-C, dated 20th October 1925).

186. The method of treatment in the *Palar plantations* was not the same as that adopted in the other fuel bearing areas of the division. A brief description of these plantations has been given in paragraphs 64 and 65 above. A rotation of ten years was fixed for felling the casuarina which had been planted between 1873 and 1890 and clear felling was carried out until 1910–11, after which 20 standards per acre were reserved in each coupe under the prescriptions of a provisional working plan which was current from 1906–07 to 1913–14. The revision of this provisional plan was not undertaken as, owing to the recommendations of the Forest Committee in 1913, five of the seven plantations were placed in class III reserves and disafforested from 1st October 1914 (B.P. No. 19696, dated 18th September 1914). In 1915, on the recommendation of Mr. P. M. Lushington, Conservator of Forests, the then Southern Circle, the five disafforested plantations were reafforested and a revised working plan for them was drawn up by Mr. T. N. Hearsey (B.P. Forest No. 107, dated 13th July 1916). Although this plan expired in 1930–31 its prescriptions have been continued from year to year.

(*b*) The latest working plans.

187. *The methods of treatment and the subdivision of the area* according to the latest working plans, are dealt with in the following paragraphs.

188. *Santavasal, Polur and Tiruvannamalai ranges.*—Mr. Gaudoin's plan prescribed simple coppice on a rotation of forty years. The District Forest Officer however had the discretion of reserving fruit trees for minor forest produce and a limited number

of seed bearers of valuable species in coupes where they appeared desirable. The fuel producing areas of the three ranges were divided into twenty felling series as detailed below :—

Santavasal Range.

1 Karnatigur felling series.
2 Santavasal felling series.
3 Attuparai felling series.
4 Kelur felling series.*
5 Velankuppam felling series.
6 Amerdi felling series.
7 Karungalthodi felling series.

Polur Range.

8 Pullemedu felling series.
9 Jambumalai felling series.
10 Parvadamalai felling series.*
11 Periamalai felling series.
12 Thaniyar felling series.

Tiruvannamalai Range.

13 Annamalai felling series.*
14 Thippakadu I felling series.*
15 Thippakadu II felling series.*
16 Kavuthimalai I felling series.*
17 Kavuthimalai II felling series.*
18 Radhapuram felling series.*
19 Kannamadai felling series.*
20 Ponniar East felling series.

* *Note.*—Felling series since transferred to Panchayat management.

189. Coupes were not numbered nor were they allotted to definite years of felling. Thus in cases where there was no demand the whole felling series was automatically closed and confusion owing to arrears of working did not arise. The District Forest Officer was at liberty to start fresh felling series in hitherto unworked areas, provided he foresaw a demand for a reasonably long sequence of coupes.

190. *Odagathur Range.*—Mr. E. K. Krishnan's tentative scheme prescribed simple coppice in the poorer areas and coppice with standards where the existing growth justified the retention of standards. In both cases the rotation was thirty years and the District Forest Officer had the discretion of retaining sound young trees capable of yielding minor forest produce. In the better type areas standards were to be selected from timber and minor forest produce yielding trees and the number was limited to 20 per acre. The fuel producing areas of the range were divided into twenty-three felling series as detailed below :—

Coppice with Standards

1 Usoor felling series.
2 Thellai felling series.
3 Panangateri felling series.
4 Naikaneri felling series.
5 Komiar felling series.

Simple Coppice.

6 Vellakal felling series.
7 Nacharkuppam felling series.
8 Pachakuppam felling series.
9 Agraram felling series.
10 Kuppampalayam felling series.
11 Kallaparai felling series.
12 Asanampet felling series.
13 Rasimalai felling series.
14 Pallipattu felling series.
15 Kachiguddai felling series.
16 Thattankanar felling series.
17 Nellimalai felling series.
18 Kylasagiri felling series.
19 Varadalampattu felling series.
20 Vellakal (Sholavaram) felling series.
21 Kaniyambadi felling series.*
22 Vandikallu felling series.*
23 Paravamalai felling series.*

* *Note.*—Felling series since transferred to panchayat management.

191. Coupes were numbered and allotted to definite years of working, and in some cases, two annual coupes were prescribed in those felling series where the numbers of the coupes which were being exploited at the commencement of the period of the plan did not correspond with those of the coupe in the majority of the felling series. By this prescription it was hoped that a stage would be reached later, when, in a particular year, the number of the coupe under working in each felling series would be the same. This however was not attained.

192. *The Palar plantations.*—With the introduction of Mr. Hearsey's Working Plan in 1916 the method of treatment in these plantations was changed from clear felling to selection-cum-improvement. A felling cycle of fifteen years was prescribed, and all dead, dying, crooked, old and hollow trees were to be removed. The stools of all trees under 3 feet in girth had to be coppiced. The seven plantations aggregating 1,388 acres were divided into four working circles as under :—

		ACS.
1 Virinjipuram—Included Virinjipuram and Ammundi plantations	..	476·25
2 Chenur—Included Chenur and Vikramachi plantations	.. ..	258·63
3 Kilminal—Included Kilminal and Tiruvellam (part) ..	.. ..	266·40
4 Tiruvellam—Included Tiruvellam (part) and Vannivedu	.. ..	386·52

193. *Cleaning.*—A cleaning was prescribed in each coupe in the Santavasal, Polur and Tiruvannamalai ranges for three successive years after felling. The operation consisted in removing creepers and weeds choking coppice growth. No cleaning was provided for in the Odagathur range, except that the contractor was expected to cut, at the time of felling, all thorny creepers and shrubs and prickly-pear within two yards of a coppiced stool. In the Palar river plantations it was prescribed that all creepers and prickly-pear should be uprooted, and the prickly-pear buried in pits, in each coupe, in the year of felling and thereafter in the fifth and tenth years.

194. *Artificial regeneration.*—In the Santavasal, Polur and Tiruvannamalai ranges nothing definite was prescribed, but the question of sowing was left to the discretion of the management. In the Odagathur range it was prescribed that suitable patches, each about one chain square, should be selected by the Range Officer in the coupe felled during the previous year and dibbled with seeds of the more important species, like *Pterocarpus marsupium, Terminalia spp, Melia indica, Albizzia spp and Anogeissus latifolia.* No burning was prescribed, seed was to be dibbled at stake at an espacement of 6′ × 6′ in prepared patches 18 inches in diameter. Sowing was to be done a month before the break of the south-west monsoon.

195. In the Palar river plantations blanks were to be restocked by planting out nursery grown seedlings at an espacement of 9′ × 9′. The species prescribed were *Inga dulcis* in low-lying areas, *Dalbergia sisso* on high ground, *Terminalia arjuna, Albizzia amara, Hardwickia binata*, red sanders and any other species that are known to do well in the locality. No *Casuarina* or *Pithecolobium saman* were to be put down. Red sanders and *Hardwickia binata* were specially prescribed for well-drained areas in Chenur and Vikramachi, while *Terminalia arjuna* and *Acacia arabica* were to be planted in low-lying places. In addition, sowing on mounds was prescribed in the Chenur and Tiruvellam Working Circles. The mounds were to be dug and got ready during April, May and the early part of June and the sowing done immediately after. Mounds were to be watered until germination took place.

196. *Cutting minor forest produce yielding trees and thorny growth at time of felling.*—In the Santavasal, Polur and Tiruvannamalai ranges nothing definite was prescribed. The District Forest Officer was made responsible for drawing up agreements embodying conditions suitable for each locality. It was however suggested that minor forest produce yielding trees be reserved irrespective of shape or size and that non-climbing shrubs, such as *Randia dumetorum,* be left standing to cover the ground if they were not saleable as fuel. In the Odagathur range, excluding the Palar river plantation coupes, it was prescribed that sound young minor forest produce yielding trees may be retained and that thorny creepers and shrubs should be cut only when growing within two yards of a coppiced stump.

197. The practice at the time of writing this plan is that practically all minor forest produce yielding trees are retained and that the contractor is not bound to cut and remove thorny and other growth two inches and under in girth except such quantity as is required for fencing the coupe.

198. *Closure to grazing.*—Grazing is strictly prohibited in the Palar river plantations. Elsewhere coupes are closed to grazing in the year of felling and for five years thereafter. Under the terms of his agreement each contractor is bound to erect a thorn fence around the coupe leased to him ; but nowhere are the dimensions of the fence specified and in most cases it is inefficient and no barrier at all.

199. *Indicator areas.*—Indicator areas are mainly intended to furnish yield figures which will serve as a check on prices bid by contractors. They were first felled in 1928–29. A separate indicator area was selected in each coupe and represented not less than 5 per cent of its area and coincided with a strip line varying in width from one to two chains. In 1930 strip lines were cleared one chain wide, or of such less width as would provide an indicator area not exceeding 1 per cent of the area of the coupe, subject to a minimum of one acre. Felling was done under departmental supervision and the expenditure incurred was recovered from the contractor who subsequently purchased the coupe in question and the resulting produce released to him after it has been stacked and measured. At the time of writing, indicator areas for the succeeding years coupes are being selected and felled in the current years coupes by the contractors themselves. This alternative is a sound one as it involves no subsequent adjustment of expenditure and should produce quite satisfactory results as the quality of growth is generally similar in adjoining coupes.

(c) Result of past working.

200. *Fellings.*—As was anticipated when Mr. Gaudoin's Working Plan was written in 1925, several of the fuel felling series which were prescribed in the Santavasal, Polur and Tirvannamalai ranges have not been worked regularly as the demand for fuel is largely

Photo by C. C. Wilson.

Cassia siamea SEEDLING IN 'RAB' PATCH $2\frac{1}{2}$ YEARS OLD.

Locality.—Santavasal fuel coupe IX.

Height.—37 feet.

met by supply from panchayat reserves, which are mostly situated around the chief Markets at Vellore, Polur and Tiruvannamalai. For the same reason there has been no regular demand for many of the fuel series in the Odagathur range. The areas felled annually from the years in which fellings were commenced according to the various working plans are given in paragraph 224 below. It is impossible to say whether the forest has improved or not as a result of past working but it is very probable that the poorer type areas have deteriorated in localities exposed to illicit felling.

201. *Cleaning.*—Prior to 1931–32 there is no record of cleaning having been done in any of the coupes. Subsequent to this date the operation was confined to creeper cutting by subordinates in the Polur range, and by either subordinates or coupe contractors in the Palar river plantations. It is recorded in the control journals that no cleaning was necessary in the worked coupes of other ranges. No expenditure was incurred on the operation except in 1919–20 and 1929–30, when Rs. 20 and Rs. 11–4–0 were spent in the Vannivedu and Virinjipuram plantations respectively.

When prickly-pear occurred in Palar river plantation coupes it was uprooted free of cost, either by subordinates or coupe contractors. The area dealt with each year has not been recorded but the operation continued until 1931–32, when the cochineal insect was introduced and in a few years destroyed practically all prickly-pear that remained.

202. *Artificial regeneration.*—In the Santavasal, Polur and Tiruvannamalai ranges as nothing was definitely prescribed nothing was done. In the Odagathur range efforts were confined to sporadic, generally unsatisfactory, dibbling by subordinates. Sowing and planting in the coupes of the Palar river plantations were discontinued in 1922 (C.C.P. Ms. No. 504, dated 30th October 1922), after which no regular planting was done, except in occasional patches by the subordinates, the species being *Cassia siamea, Melia dubia* and red sanders.

203. In 1931–32 the system of restocking blanks in worked fuel coupes by '*rab*'* sowings was introduced. As this system has now been adopted in fuel coupes throughout the Presidency it is not necessary to enter into a detailed description of it here. The species sown were *Cassia siamea, Acacia sundra, Albizzia amara, Albizzia lebbek, Melia indica, Terminalia tomentosa, Terminalia paniculata, Terminalia arjuna, Pongamia glabra, Sapindus trifoliatus, Anogeissus latifolia,* teak, rosewood, vengai and red sanders. Sowing was done in July and September. The July sowing was generally ineffective, while that done in September produced good germination but the subsequent development of the seedlings was poor. In fact, with the exception of *Cassia siamea, Acacia sundra, Albizzia lebbek* and *Albizzia amara* few seedlings survived the first hot weather. There is no doubt that *Cassia siamia* gives the best results. The '*rab*' patches sown in Santavasal Coupe IX are a striking example of what can be achieved by this method. The photograph opposite taken by Mr. C. C. Wilson, Conservator of Forests, shows a *Cassia siamea* seedling in one of these patches which attained a height of 37 feet in 2½ years. The following statement shows the areas restocked since 1931–32.

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* Dibbling seeds in the ash of burnt heaps of debris.

Year.	Names of felling series and coupe number.	Area treated.	Preparation of soil and dibbling.	First weeding.	Fencing.	Second weeding and replacing casualties.	Total cost per acre.	Date of enumeration.	Cassia siamea.	Albizzia amara.	Albizzia lebbek.	Sapindus trifoliatus.	Dalbergia latifolia.	Acacia sundra.	Tectona grandis.	Melia indica.	Terminalia paniculata.	Terminalia tomentosa.	Anogeissus latifolia.	Pterocarpus marsupium.	Pongamia glabra.	Pterocarpus santalinus.	Terminalia arjuna.
			Cost of operation.					Species sown and result of operation.															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
		ACS.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.																
								Odagathur Range.															
1933-34 ..	.. Not specified	Free of cost.						Only Cassia siamea sown.						Regeneration prolofic.									
								Santavasal Range.															
1931-32 ..	.. Santavasal, VIII	23	51 14 0	26 5 0	..	..	3 6 0	Not known.	619	183	130	65	30	470	83	103	0	0	0	34	..	..	..
								Do.	80	35	8	129	0	173	48	38	0	0	0	2	..	..	..
1932-33 ..	.. Santavasal, IX	20	45 14 0	9 0 0	1 0 0	13 6 0	3 7 0	March 1933.	878	142	492	26	0	683	34	6	0	0	0	1	..	..	..
1933-34 ..	.. Santavasal, X	15	36 12 0	6 12 0	1 0 0	10 4 0	3 10 0	January 1934.	896	52	669	7	0	402	41	0	0	0	0	11	38	..	..
1934-35 ..	.. Santavasal, XI	10	30 7 0	4 11 0	1 8 0	2 6 0	3 14 0	15th February 1935.	1727	230	353	..	..	447	..	161	..	..	..	..	48	9	..
								Polur Range.															
1933-34 ..	.. Thaniar, X	15	35 3 0	..	..	..	2 6 0	February 1934.	844	200	3	..	..	48	82	633	..	2	..	46	..	..	..
1934-35 ..	.. Thaniar, XI	22	33 10 0	..	..	2 4 0	1 10 0	January 1935.	Species not known.					486 patches successful.									
								Tiruvannamalai Range.															
1933-34 ..	.. Ponniar East, VIII	30	46 1 0	7 0 0	..	..	1 12 0	January 1934.	592	340	643	245	..	1,233	..	313	..	..	..	..	..	..	22
1934-35 ..	.. Ponniar East, IX	230 patches.	40 2 0	7 0 0	..	3 0 0	..	Not known.	734	71	95	27	..	96	..	3	..	..	..	..	..	..	..

Note.—Where zero occurs in a species column it means that the species was sown but that there was no germination. Blanks indicate that the species was not sown.

Minor Forest Produce.

204. Very little is recorded in *early working plans* regarding the exploitation of minor forest produce. All that was prescribed is contained in the sentence 'The lease system might be continued as hitherto', or words to that effect. That there was systematic working however is evident from the information contained in the second paragraph of Chapter II of Mr. K. R. Venkataramana Ayyar's Working Plan of 1920 for the Santavasal, Polur and Tiruvannamalai ranges, from which the following paragraphs are extracts.

205. "The right to collect minor forest produce was leased annually to the highest bidder, separate leases being granted for—

(*a*) Avaram bark, *Cassia auriculata.*
(*b*) Konnai bark, *Cassia fistula.*
(*c*) Surul bark, *Ventilago madraspatana* and *Ventilago calyculata.*
(*d*) Other minor forest produce.

The leases in all cases were for the forest year ending 30th June.

206. "There is very little avaram in the reserved forests, but for the facility of working, the prevention of possible smuggling of the produce and avoidance of friction between neighbouring contractors, the right to collect avaram bark in the reserves and unreserves of each forest range was sold in one lot, as sale in smaller units, such as by Revenue Inspector's firka, was not found feasible. The lease was sometimes granted for one year but at other times for three years. This system continued until 1918 when the control of the collection and sale of this bark was taken up by the Munitions Department on a fixed annual rental as a war measure. This control was however relaxed in 1919 when the right was as usual sold in auction as one lot for the collection of the produce from all the reserved forests and unreserved lands of each range. . . . it may be estimated that only about 5 per cent of the annual revenue from this source in each range could be credited to the reserved forests.

207. "*Cassia fistula,* on the other hand, is chiefly found in the reserved forests, though an occasional tree may be found in the unreserves. The reasons which led to the rangewar sale of avaram bark also applied in the case of konnai bark, and the right to collect the latter bark was sold on an annual or triennial lease until the year 1912–13, when the cutting down of the tree for its bark was stopped on silvicultural grounds. Owing however to the special demand which arose for this bark during the war, its collection was resumed in the year 1917–18, as a special war measure, when the right to collect it was sold in auction in 1917–18 and 1918–19 after which it was stopped. Nearly 80 per cent of the average annual revenue in the past, from this source, can be credited to the reserved forests.

208. "As regards sural bark, the lease was annual and the sale by ranges, the collection extending over all the reserves and unreserves in each range. This climber, from the root of which the bark for dyeing is extracted, is mostly found in the reserved forests.

209. "The other articles of minor forest produce . . . were sold annually in separate blocks, each block comprising a whole bamboo working circle under the old arrangement."

210. *Mr. K. R. Venkataramana Ayyar's Working Plan* divided the three ranges, Santavasal, Polur and Tiruvannamalai, into ten minor forest produce blocks, each block coinciding with a bamboo block. The right of collection was sold annually in auction for the year ending 30th June. The unit of sale was a block, except that in the case of avaram and sural barks each range was sold separately.

211. In 1925 Mr. K. R. Venkataramana Ayyar's plan was superseded by *Mr. Gaudoin's Plan,* but the system of working remained essentially the same. The whole area was divided into a number of farms and the farm became the unit of sale. The District Forest Officer was however allowed the discretion, should a demand arise, of combining two or more farms together and of selling on a biennial lease products which have a commercial value such as barks and nuxvomica. The following statement shows the subdivision of the area into farms :—

Minor Forest Produce Farms.

For Avaram bark—

1	Reserves and unreserves of the Polur range.		
2	Do.	do.	Santavasal range.
3	Do.	do.	Tiruvannamalai range.

For nux vomica—

1	Reserves of the Polur range.	
2	Do.	Santavasal range.
3	Do.	Tiruvannamalai range.

For Sural bark—

1 Reserves of the Polur range.
2 Do. Santavasal range.
3 Do. Tiruvannamalai range.

Other minor products—

Santavasal range ..	1 *Amerdi farm.*—Includes the Amerdi bamboo block, Amerdi fuel felling series, Amerdi plantation and Attuparai timber and fuel felling series. 2 *Odagathur farm.*—Includes Odagathur hill and plains bamboo blocks. 3 *Shembakatope farm.*—Includes Shembakatope hill and plains bamboo blocks. 4 *Santavasal farm.*—Includes Santavasal reserve excluding portions included in Santavasal bamboo felling series. 5 *Karnatigiri farm.*—Includes Karnatagiri reserve excluding the portion included in Santavasal bamboo felling series.
Polur range ..	6 *Arasampet farm.*—Includes Arasampet bamboo block. 7 *Komitiyeri farm.*—Includes Komitiyeri bamboo block. 8 *Chillimalai farm.*—Includes Patrakad reserve. 9 *Periyamalai farm.*—Includes Periyamalai reserve. 10 *Parvadamalai farm.*—Includes Mulakad reserve.
Tiruvannamalai range	11 *Ponniar farm.*—Includes the portion of the Ponniar reserve falling within the division. 12 *Kalroyan farm.*—Includes the Valasamalai, Nattampalli, Perungolathur Swamimalai and Pavunjipattu reserves.

NOTE.—Farms, or parts thereof, which have since been transferred to Panchayat management have not been included in the above.

212. In the Odagathur range the right to collect minor forest produce, other than barks, was sold annually in blocks, the arrangement of which varied from time to time. In the case of barks the unit of sale was the range. Prior to 1919 the blocks were so arranged that the collection in each could be controlled by the nearest tannadar. With the abolition of tannadars an arrangement was adopted whereby each block consisted of a group of reserves, or parts thereof, which were adjacent to one and the same market. With minor changes the system has continued to date. The latest arrangement, adopted in 1933, is as follows :—

Block I.—Includes Athiyur, Thellai, Kylasagiri and part of the Arasambattu reserves.

Block II.—Includes Appukal, Nellimalai and part of the Arasambattu reserves.

Block III.—Includes Karuthamalai reserve and Arasambattu rest-house compound.

Block IV.—Includes Vellakal, Ambur, Ambur Fuel and Shanankuppam reserves and the Ambur rest-house compound.

213. The *Palar river plantations*, with the exception of Virinjipuram and Vikramachi which are grouped together, are leased separately for the collection of minor forest produce.

214. *Results of past working* show that the present arrangement of leases works satisfactorily. However, when one pauses to consider that the average jurisdiction of a forest guard and his watcher is 8·66 square miles, it can easily be understood that it is impossible for subordinates to exercise an efficient control over removals. Each contractor submits a monthly statement showing the quantity of each item of produce removed by him during the period of his lease, but it is probable that the figures so furnished are inaccurate and not to be relied on.

SECTION 3.—FIRE PROTECTION.

215. The system of fire protection in vogue falls under three heads, namely, (*a*) special, (*b*) general and (*c*) early burning.

(*a*) *Special protection*—

(i) Each 'specially protected block', vide paragraph 153 above, is protected by a 30 feet wide fire line all round it and these lines are always kept clear by the Malayalees under the hill village system.

(ii) Two *interior fire lines* are being maintained to a width of 66 feet, one the Gangavaram fire line and the other the Karnatigur fire line. The Gangavaram line marks the southern limits of the sandal areas as they existed in 1915, and runs from the southern-most corner of Patrakad reserve in a north-easterly direction to Valipariamalai in the Moolakad reserve. It was probably intended to serve as a fire barrier to prevent fires crossing over from non-sandal to sandal bearing areas. As sandal has now extended far south of the line, the line no longer serves the purpose for which it was probably intended. Further, as most of the fires in the Javadi hills are due to incendiarism, other

methods must be employed for their prevention. The Karnatigur line runs parallel to the general direction of the Karnatigur bridle path and crosses the path at several places in between zigs. The object of this line is obscure and as it runs straight up the hillside, at right angles to the contours, it is of no value. The length of the Gangavaram fire line is 16 miles 2 furlongs, while that of the Karnatigur fire line is 13 miles 6 furlongs. The annual expenditure incurred on clearing and burning these lines is Rs. 182.

(iii) The following *exterior fire lines* in the Kalroyan hills of the Tiruvannamalai range are cleared and burnt annually at an average cost of Rs. 1–10–0 per mile.

	Miles.	Furlongs.
Southern boundary of Nattampalli Reserve, adjoining jagirs.	5	1
Common boundary between the Perungulathur-Swamimalai and Natampalli reserves.	2	4
Common boundary between the Nattampalli and Valasamalai reserves.	0	3

(*b*) *General protection.*—Under the Forest village system the Javadi hill reserves of the Santavasal and Polur ranges and that part of the Thellai reserve situated in the Odagathur range are divided into 153 grazing blocks—vide paragraph 120 above. Each block is assigned to a definite village for fire protection and the villagers are paid rewards (dealt with further in paragraph 218 below) at the end of the fire season if there have been no fires at all; smaller rewards if, should a fire have broken out, they have circumscribed its limits to a small area; and no rewards if any large area has been burnt. The same system is being followed in the Valasumalai, Nattampalli and Perungolathur-Swamimalai reserves on the Kalroyan hills. Elsewhere in the division local subordinates are responsible for general fire protection and can of course obtain assistance from neighbouring villages.

(*c*) *Early burning.*—Early burning was prescribed for the whole of the Odagathur range but the system was not followed as, it is recorded, conditions in the division did not appear to require it. The following cart-tracks and foot-paths were however fire traced annually early in the fire season at an average cost of Rs. 2 per mile.

	Miles.
Asanampet-Alangayam cart-track	1½
Ambur-Asanampet cart-track	1½
Sholavaram-Vellakal foot-path	2½ (with next)
Athiyur-Karumalai foot-path	
Ambur-Naickaneri foot path	1

216. *Results of fire protection.*—The following statement, extracted from administration reports, show the area over which fire protection was attempted during the five years ending 1934 and the extent and percentage which was successfully protected :—

Calendar year. (1)	Area attempted square miles. Special. (2)	General. (3)	Area protected square miles. Special. (4)	General. (5)	Percentage of success. Special. (6)	General. (7)	Remarks. (8)
1930	158	309	152	306	96·2	99·0	Areas are furnished to the nearest square mile and the percentages calculated thereon.
1931	158	309	146	303	92·4	98·1	
1932	158	309	155	294	98·1	95·1	
1933	158	309	156	302	98·7	97·7	
1934	158	309	155	303	98·1	98·1	

217. *Costs.*—The following statement shows the expenditure incurred on fire protection for the five years ending 1934 :—

Calendar year. (1)	Maintenance of interior fire lines. (2) RS. A. P.	Maintenance of exterior fire lines. (3) RS. A. P.	Fire rewards. (4) RS. A. P.	Fire tracing cart-tracks and foot-paths. (5) RS. A. P.	Total expenditure. (6) RS. A. P.	Total area attempted to be protected. (7)	Cost per square mile. (8) RS. A. P.
1930	205 2 0	94 0 0	683 4 0	40 0 0	1,022 6 0	158 square miles.	6 7 0
1931	223 12 0	94 0 0	672 3 0	8 0 0	997 15 0		6 5 0
1932	90 6 0	32 0 0	672 5 0	9 13 0	804 8 0		5 1 0
1933	104 14 0	32 0 0	773 2 0	10 0 0	920 0 0		5 13 0
1934	192 0 0	16 0 0	674 14 0	10 0 0	892 14 0		5 10 0

218. *Rewards.*—After the close of the fire season, grazing blocks are inspected by Range Officers who submit their recommendations for payment of rewards to the various villagers in proportion to the degree of protection obtained. Necessary sanction having been received from the Conservator, the rewards are distributed, in 'durbar', but not until about twelve months have lapsed after the close of the fire season to which they relate. This delay is unnecessary and it is probable that payment of rewards as soon as possible after the fire season would stimulate co-operation and encourage the villagers to take a greater interest in the operation. The maximum fire rewards work out to Rs. 1–15–0, As. 4 and As. 12 per 100 acres for the Santevasal, Polur and Tiruvannamalai ranges respectively. There appears to be no reason for this large variation and it is not known on what factors the reward has been fixed for each grazing block. The amount of rewards disbursed annually during the five years ending 1934 is shown in column 4 of the statement in the preceding paragraph.

SECTION 4.—SPECIAL WORKS OF IMPROVEMENT UNDERTAKEN.

219. *Roads.*—The following statement gives a list of roads and cart-tracks maintained by the department. Item No. 11, the Amerdi-Nadanur road was constructed in accordance with a proposal contained in paragraph 40 of Mr. Wilson's Working Plan. The road from Nadanur to Patrakad, also proposed in the same working plan, was not constructed as the Patrakad-Chillimalai road was considered a sufficient outlet for produce removed from the forests in the vicinity of Patrakad.

Serial number and name of road or cart-track.	Year of construction.	Capital cost.	Length.		Average annual cost of maintenance.*	Remarks.
(1)	(2)	(3)	(4)		(5)	(6)
		RS.	M.	F.	RS.	
Odagathur Range.						
1 Anicut-Pinnathurai road ..	1910 ..	937	8	..	284	The North Arcot District Board contributes one-third the cost of maintenance subject to a maximum of Rs. 500 a year.
2 Ambur-Asanampet road ..	1913 ..	3,644	13	..	344	
3 Asanampet-Alangayam cart-track.	1913–14 ..	320	2	6	13	Up to the Range boundary. Not being maintained since 1933.
4 Pinnathurai-Odagathur road.	1914 ..	1,687	4	3	53	The North Arcot District Board contributes one-third the cost of maintenance subject to a maximum of Rs. 500 a year.
5 Odagathur-Arasampet road.	1914 ..	1,770	4	6	166	
6 Ambur-Asanampet Road—Panangatteri.	1924 ..	90	0	4	3	....
7 Thellai-Palamaruthurkadai cart-track.	1928 ..	254	1	2	..	No longer maintained. ....
Santavasal Range.						
8 Santavasal-Shembakatope road.	1916 ..	1,050	6	7	142	....
9 Kinnikulam-Amerdi road ..	1920–21 ..	535	4	2	176	....
10 Amerdi-Nadanur road ..	1923 ..	1,90,200	11	..	254	'Latham' road.
11 Amerdi rest-house approach road.	1932–33 ..	88	1	5	..	....
Polur Range.						
12 Athimoor-Chillimalai road ..	1914 ..	393	5	3	136	....
13 Chillimalai-Patrakad road ..	1914–15 ..	14,806	5	5	616	Cost of maintenance includes about Rs. 1,600 spent during 1933–34 and 1934–35 on clearing a large number of land slips and widening zigs.
14 Alangayam-Komattiyur road.	1919 ..	11,562	4	1	95	Part of 'Gillman' road.
15 Veeralur-Jambumalai road.	1923 ..	363	2	5	43	....
16 Komattiyur-Patrakad road.	1924 ..	30,423	12	..	174	'Lushington' road.
17 Patrakad rest-house approach road.	1925 ..	600	0	3	..	....
18 Jamnamarthur-Burgur road.	1928–29 ..	2,000	4	4	58	....
19 Mandaparai-Burgur road ..	Constructed by Bamboo contractors.		11	4	105	....
20 Burgur-Arasampet cart-track.						

220. *Buildings.*—The following is a list of buildings in the division :—

Serial number and name of building.	Year of construction.	Capital cost.	Nature of building.	Average annual cost of maintenance.*
(1)	(2)	(3)	(4)	(5)
		RS.		RS.
Headquarters.				
1 District Forest Officer's bungalow	1929 ..	23,622	Terraced and tiled.	304

* Based on the actuals for three years ending 1934–35.

Serial number and name of building. (1)	Year of construction. (2)	Capital cost. (3)	Nature of building. (4)	Average annual cost of maintenance.* (5)
	Odagathur Range.	RS.		RS.
2 Kylasagiri rangers' camping shed	1900	181	Thatched.	15
3 Virinjipuram rest-house	1901	1,591	Tiled	12
4 Virinjipuram forest guards' shed	1901	60	Do.	2
5 Chennur forest guards' shed	1901	60	Do.	..
6 Ambur rangers' camping shed	1901	77	Do.	9
7 Banavaram rest-house	1902	1,368	Do.	11
8 Ambur rest-house	1904	2,865	Do.	38
9 Arasampet rest-house	1904	1,619	Do.	22
10 Asanampet rest-house	1904	1,625	Do.	29
11 Kylasagiri rest-house	1904	2,585	Do.	..
12 Odagathur rest-house	1904	1,676	Do.	83
13 Panangatteri subordinates' quarters	1908	285	Do.	4
14 Tottalam subordinates' quarters	1908	905	Do.	5
15 Pinnathurai rest-house	1909	1,454	Do.	31
16 Odagathur Range Officer's quarters	1914	3,069	Do.	40
17 Odagathur Range Office	1914	1,935	Do.	17
18 Odagathur subordinates' quarters	1915	2,778	Do.	30
19 Kinnikulam subordinates' quarters	1916	987	Do.	15
20 Naikaneri rest-house	1924	674	Thatched.	27
21 Thellai inspection shed	1927	790	Do.	38
	Santavasal Range.			
22 Nadanur rest-house	1905	2,158	Tiled	49
23 Athuvambady inspection shed	1905	712	Thatched.	18
24 Amerdi rest-house	1909	1,651	Tiled	29
25 Shembakatope rest-house	1914	3,137	Do.	22
26 Santavasal Range clerk's quarters (old rest house)	1915	794	Thatched.	21
27 Santavasal Range Office	1917–18	2,167	Tiled	10
28 Melkuppachinur sandalwood godown	1918	1,355	Do.	6
29 Thongamalai subordinates' quarters	1918–19	3,227	Do.	9
30 Thongamalai rest-house	1920	4,047	Do.	14
31 Santavasal Range Officer's quarters	1925	4,705	Do.	13
32 Nadanur subordinates' quarters	1925	2,740	Do.	..
	Polur Range.			
33 Mandaparai rest-house	1906	462	Thatched.	34
34 Moolakad rest-house	1910	1,285	Tiled	16
35 Komattiyur subordinates' quarters	1910	1,885	Do.	13
36 Patrakad rest house	1916	4,888	Do.	20
37 Patrakad foresters' quarters	1916	1,051	Thatched.	20
38 Koilur inspection shed	1918–19	2,053	Tiled	25
39 Taniar rest-house	1920	1,129	Do.	10
40 Burgur subordinates' quarters	1920	1,673	Do.	10
41 Komattiyur foresters' quarters	1920	1,051	Thatched.	42
42 Komattiyur rest-house	1920	6,578	Tiled	46
43 Burgur sandalwood weighing shed	1933–34	105	Corrugated iron sheets.	..
	Tiruvannamalai Range.			
44 Tandrampet inspection shed	1907	254	Thatched.	16
45 Pavunjipettu subordinates' quarters	1909	623	Tiled	50
46 Tiruvannamalai Range Office	1909	9,547	Do.	29
47 Tiruvannamalai range clerks' quarters	1911	543	Do.	18
48 Athipadi subordinates' line	1911	477	Do.	..
49 Rayandapuram subordinates' line	1911	478	Do.	..
50 Tanipadi rest-house	1913	2,286	Do.	14
51 Tiruvannamalai rest-house	1913	1,620	Do.	50
52 Pavunjipattu rest-house	1916	2,000	Do.	7
53 Bheemarapatti rest house	1919	2,250	Do.	43
54 Pudur inspection shed	1928	860	Thatched.	1

* Based on the actuals for three years ending 1934–35.

221. *Wells.*—The following is a list of wells in the division :—

Serial number and situation. (1)	Year of construction. (2)	Capital cost. (3)	Description. (4)	Average annual cost of maintenance. (5)
		RS.		RS. A. P.
	Headquarters.			
1 District Forest Officer's bungalow	1929	602	Brick in mortar.	1 5 0
	Odagathur Range.			
2 Banavaram rest-house	1900	400	Brick in mortar.	1 11 0
3 Odagathur rest-house compound	1904	102	Brick in mud	3 5 0
4 Ambur rest-house compound	1904	600	Brick in mortar.	..
5 Odagathur range office compound	1914	224	Do.	1 11 0
6 Pinnathurai rest-house compound	1914	123	Do.	1 11 0
7 Tottalam subordinates' quarters	1934	302	Brick in mud	..
8 Kinnikulam subordinates' quarters	Not known.	202	Do.	1 4 0
9 Virinjipuram rest-house compound	Do.	150	Do.	..
10 Kilminal rest-house compound	Do.	100	Earthernware sections.	..
11 Kallaparai	Do.	150	Rough stone dry.	..

Serial number and situation. (1)	Year of construction. (2)	Capital cost. (3)	Description. (4)	Average annual cost of maintenance. (5)		
		RS.		RS.	A.	P.
Santavasal Range.						
12 Athuvambadi rest house compound	Prior to 1902.	Not known.	Brick in mortar.	1	1	0
13 Shembakatope rest-house compound	1914 ..	650	Do.	4	11	0
14 Nadanur rest-house compound	1923 ..	250	Brick in mud ..	3	1	0
15 Santavasal range office compound	1923 ..	280	Do. ..	..		
16 Thongamalai village †	1929 ..	338	Brick in mortar.	..		
17 Sathampet village †	1929–30 ..	332	Brick in mud ..	..		
18 Amerdi village †	1931 ..	361	Do. ..	..		
19 Periyattipatti village †	Not known.	295	Do. ..	..		
Polur Range.						
20 Taniyar rest-house compound	1902 ..	165	Brick in mortar.	3	2	0
21 Mulakad rest-house compound	1910 ..	165	Do.	..		
22 Komattiyur rest-house compound	1919 ..	1,340	Tube well ..	48	0	0
23 Mandaparai rest-house compound (just outside) * ..	1919 ..	1,340	Do. ..	14	7	0
24 Komattiyur old Madras Forest College camping ground.	1923–24 ..	32	Brick in mud ..	1	15	0
25 Mandaparai village (in Periappa Kavandan's field). †	1925 ..	201	Rough stone in mortar.	..		
26 Koilur village	1925–26 ..	125	Brick in mud ..	..		
27 Kuttakarai village †	1929–30 ..	545	Brick in mortar	..		
28 Jadayanur village †	1929–30 ..	495	Brick in mud plastered in cement.	..		
29 Burgur village †	1929–30 ..	475	Do.	..		
30 Patrakad village (Arunachala Kavandan's field). †	1929–30 ..	310	Rough stone in mortar.	..		
31 Naga Kuttai village	Not known.	209	Brick in mortar.	..		
Tiruvannamalai Range.						
32 Tiruvannamalai rest-house compound	1905 ..	443	Brick in mortar.	..		
33 Tandrampet inspection shed compound	1908 ..	185	Do.	..		
34 Pavunjipattu rest-house compound	1910 ..	405	Do.	..		
35 Tanipadi rest-house compound	1913 ..	283	Do.	..		
36 Bheemarapatti rest-house compound	1919 ..	132	Do.	..		
37 Puduchekkadi inspection shed compound †	1926 ..	404	Do.	..		
38 Navukollai subordinates' quarters	Not known.	301	Do.	..		

NOTE.—* Out of action at time of writing.
† Funds provided by the District Board, North Arcot, but constructed by the Forest Department.

SECTION 5.—PAST YIELDS.

222. *Sandalwood.*—The following statement shows the outturn of sandalwood from regular fellings, carried out in accordance with the prescriptions of the Sandalwood Working Plan. Quantities obtained from wind blown and illicitly felled trees have not been included. It will be noticed that the year 1917–18 has been omitted in the statement : the omission has been explained in paragraph 148 above.

Statement showing the annual outturn of sandalwood-1915–1935.

Year of extraction.	Coupe number.	Santavasal Range.													Polur Range																	
		Thongamalai.				Amerdi.				Nadanur.					Veerappanur.				Patrakad.				Komattiyur.									
		Number of trees.	Yield of heart wood.			Number of trees.	Yield of heart wood.			Number of trees.	Yield of heart wood.				Number of trees.	Yield of heart wood.			Number of trees.	Yield of heart wood.			Number of trees.	Yield of heart wood.								
(1)	(2)	(3)	(4)			(5)	(6)			(7)	(8)				(9)	(10)			(11)	(12)			(13)	(14).								
			QRS.	LB.	OZ.		QRS.	LB.	OZ.		QRS.	LB.	OZ.			RS.	LB.	OZ.		QRS.	LB.	OZ.		QRS.	LB.	OZ.						
1915-16	.. I ..	186	227	2	6	1,562	1,907	0	14	71	86	19	2		479	645	16	14	193	260	3	10	350	471	20	10						
1916-17	.. II ..	220	277	25	12	1,184	1,497	2	8	50	88	23	3		105	202	5	0	168	206	9	1	359	549	8	4						
1918-19	.. III ..	297	247	23	5	1,762	1,849	21	8	203	312	23	5		351	477	5	0	477	291	5	5	924	1,239	24	8						
1919-20	.. IV ..	2,148	1,480	13	2	628	881	24	10	155	395	7	0		1,083	917	3	11	1,078	1,328	5	8	646	992	8	2						
1920-21	.. V ..	4,504	1,652	6	0	936	1,054	0	0	530	786	14	8		516	272	23	0	1,419	1,282	6	0	1,046	1,132	9	12						
1921-22	.. VI ..	145	151	2	4	1,083	908	26	0	1014	1,010	15	8		1,017	535	3	0	1,770	1,950	17	0	1,050	828	7	2						
1922-23	.. I ..	615	219	1	6	786	522	6	8	154	193	4	12		509	440	0	12	2,388	2,435	27	8	571	708	0	0						
1923-24	.. II ..	751	474	24	0	487	630	21	4	135	249	25	4		104	194	13	4	1,322	1,488	6	4	521	756	1	12						
1924-25	.. III ..	415	213	9	0	715	949	20	0	292	442	6	0		489	417	15	8	2,169	2,599	14	0	1,483	2,670	13	0						
1925-26	.. IV ..	147	89	11	4	296	452	26	0	161	438	14	0		437	667	25	0	758	1,222	19	8	596	1,098	20	0						
1926-27	.. V ..	489	421	15	8	450	699	17	0	518	1,445	10	0		206	366	25	8	1,616	1,737	1	8	1,029	1,608	23	8						
1927-28	.. VI ..	322	310	13	8	379	604	21	8	1,474	1,306	19	8		437	429	0	12	1,014	1,268	17	8	1391	1,408	14	0						
1928-29	.. I ..	1,373	1,004	5	8	471	605	15	8	283	257	1	0		1,578	261	27	8	1,080	1,742	0	12	428	669	19	4						
1929-30	.. II ..	782	627	4	8	493	768	26	0	106	126	14	8		57	113	8	12	502	754	18	0	759	1,124	27	12						
1930-31	.. III ..	386	258	14	4	303	460	1	8	151	293	6	8		321	568	15	12	769	1,125	16	11	1,504	2,800	24	11						
1931-32	.. IV ..	607	583	4	4	583	1,186	12	2	115	212	16	8		273	408	6	8	511	836	12	10	246	445	9	8						
1932-33	.. V ..	750	642	23	4	459	822	6	8	384	553	23	8		74	161	15	12	400	711	11	8	399	754	13	8						
1933-34	.. VI ..	113	121	24	0	337	666	8	0	472	468	13	0		205	206	2	8	103	161	10	12	309	410	7	4						
1934-35	.. I ..	1,449	1,119	16	12	419	600	27	4	130	154	19	0		372	302	14	12	510	921	1	0	243	382	24	0						

223. *Bamboos.*—It is not possible to furnish a statement showing the annual yield of bamboos as in many cases the control journals, compiled from figures furnished annually by contractors, do not show whether the quantities removed are cart-loads, head loads or number of culms. The revenue realized annually by the sale of bamboo coupes, for the three years ending 1934–35, is to be found in section 6 below.

224. *Fuel and small timber.*—The following statements show the quantities of fuel and small timber removed annually from the various felling series.

Statement of yield, fuel and small timber, from all felling series excluding those in the Palar river plantations.

Felling series.	Year of felling. 1923–24. Area worked.	1923–24. Yield. Fuel.	1923–24. Yield. Timber.	1924–25. Area worked.	1924–25. Yield. Fuel.	1924–25. Yield. Timber.	1925–26. Area worked.	1925–26. Yield. Fuel.	1925–26. Yield. Timber.	1926–27. Area worked.	1926–27. Yield. Fuel.	1926–27. Yield. Timber.	1927–28. Area worked.	1927–28. Yield. Fuel.	1927–28. Yield. Timber.	1928–29. Area worked.	1928–29. Yield. Fuel.	1928–29. Yield. Timber.
(1)	(2) ACRES.	(3) TONS.	(4) C. FT.	(5) ACRES.	(6 TONS.	(7) C. FT.	(8) ACRES.	(9) TONS.	(10) C. FT.	(11) ACRES.	(12) TONS.	(13) C. FT.	(14) ACRES.	(15) TONS.	(16) C. FT.	(17) ACRES.	(18) TONS.	(19) C. FT.
Odagathur Range.																		
Naikaneri	100	758	1,920	146	669	920	86	342	240	68	435	300	140	441	1,414	..	..	..
Panankatteri	60	228	40	136	535	60	34	11	180	98	55	170	197	512	200	89	245	..
Vellakkal (Ambur)	25	51	20	45	72	..	50	40	..	55	45	..	60	102	..	..	..	..
Natcharkuppam	48	176	20	65	275	20	65	134	..	47	220	..	..	..	..	124	242	..
Patcharkuppam	46	184	..	17	55	..	35	87	..	56·5	90	..	56	62	..	37	60	..
Agraram	44	202	..	45	57	..	45	33	..	6	8	..	40	84	..	..	..	..
Kuppampalaiyam	40	351	..	64	299	..	46·5	209	..	39	230	..	49·5	156	..	34·5	176	20
Pallipattu	61	464	200	64	653	140	65	539	160	46	720	190	73·5	755	380	51	403	480
Kallapari	34	217	400	78	314	300	79	436	405	68	411	320	92	242	880	48	150	260
Asanampet	..	..	..	..	..	..	..	..	..	79	298	200	81	553	100	88	563	380
Rasimala	63	280	..	70	476	20	60	650	20	84	521	60	47	194	..	20·5	140	..
Kuchguddai	42	60	..	40	195	20	20	71	..	36	63	..	40	165	40	..	..	..
Tattankinar	..	..	..	72	500	..	37	508	..	39 5	352	..	65	296	..	58·52	201	20
Komiar	77	675	180	80	456	160	73	346	120	109	481	180	101·5	508	..	39	227	140
Nelimalai	34	88	..	36	275	..	30	112	..	18	14	..	16	20	..	23	139	..
Varadalampet	73	191	..	60	47	..	38	26	..	61	38	..	..	..	..	..	..	..
Usoor	58	432	..	63	326	..	63	67	..	68	76	..	63	Not recorded		73	1,825	235
Kylasagiri	49	107	..	44	33	..	46	78	..	40	63	..	39·5	115	..	45	74	..
Vellakal (Sholavaram) ..	36	135	..	45	48	..	23	25	..	29	32	..	34·5	58	..	30	50	..
Thellai	38	750	..	45	206	..	37	269	..	90	315	..	45	Not recorded.		91	395	..
Santavasal Range.																		
Karungalthody	42·5	80	..	38·5	232	160	58·5	228	..	51	363	180	42	313	..	47	375	..
Amerdi	21	142	..	10	Not recorded.		15	116	..	8	50	..	11·5	100	..	15	100	..
Attuparai	42·5	24	..	20·5	69	..	31	110	..	10·5	136	..	6	22	..	..	..	..
Santavasal	33·25	155	..	27·5	182	..	14	131	..	22·5	198	..	68·5	402	..	58	489	..
Velamkuppam	11	12	..	20	46	..	..	..	..	..	..	..	..	..	..	..	..	..
Karnatigiri	56	156	..	..	..	..	10	51	160	17	270	20	65	430	..	58	290	80
Polur Range.																		
Taniar	71·4	532	1,840	68·5	384	280	46·5	350	60	91·5	646	440	101	427	..	70·25	304	..
Periamalai	17·25	40	80	23	52	..	3·5	9	4	36	167	..	37	131	30	23	17	20
Pullimedu	30	144	..	14	85	100	20	109	..	39	191	40	38	248	20	23	123	..
Jambumalai	..	..	..	Sold but not worked.			..	..	..	..	..	..	..	..	..	31	79	40
Tiruvanuamalai Range																		
Ponnair East	..	..	..	93·5	521	..	45·5	170	..	41	Not worked.		145	706	..	131	396	..
Perunkolathur Swamimalai.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Statement of yield, fuel and small timber, from all felling series excluding those in the Palar river plantations—cont.

Year of felling.

Felling series. (1)	1929-30. Area worked. (20) ACRES.	1929-30. Yield. Fuel. (21) TONS.	1929-30. Yield. Timber. (22) C. FT.	1930-31. Area worked. (23) ACRES.	1930-31. Yield. Fuel. (24) TONS.	1930-31. Yield. Timber. (25) C. FT.	1931-32. Area worked. (26) ACRES.	1931-32. Yield. Fuel. (27) TONS.	1931-32. Yield. Timber. (28) C. FT.
Odagathur Range.									
Naikaneri	117	418	740	88·5	734	3,580	77	223	..
Panankatteri	70	140	..	84	122	..	114·5	229	..
Vellakal (Ambur)	56	106	..	48	50	..	30	43	..
Natcharkuppam	45	102	..	64	100	..	..	..	..
Patcharkuppam	58	175	..	59	254	..	8	14	..
Agraram	..	..	..	22	5	..	41	57	..
Kuppampalayam	98	171	60	55	248	120	31	231	320
Pallipattu	78	573	320	68	326	20	72	313	..
Kallaparai	..	..	..	..	..	..	..	..	..
Asanampet	90	548	140	80	419	60	101	495	..
Rasimalai	..	..	..	61	121	..	..	..	..
Kuchiguddai	..	..	..	..	..	..	..	..	..
Tattankinar	51	406	..	47	365	..	42	339	..
Komiar	50	213	140	89	388	140	34	60	..
Nellimalai	24	117	..	31	54	..	..	..	..
Varadalampet	..	..	..	..	..	..	..	..	..
Usoor	82	2,132	339	71	2,343	303	62	304	..
Kylasagiri	46	89	..	41	147	..	46	137	..
Vellakal (Sholavaram) ..	36	28	..	32	104	..	52	60	..
Thellai	86	418	..	72	229	..	95	569	..
Santavasal Range.									
Karungalthody	18	116	100	52	347	521	59	145	140
Amerdi	9	133	..	17	102	..	21	120	..
Attuparai	12	63	40	43	..	480	41	186	640
Santavasal	42	354	..	45	357	..	42	416	..
Velamkuppam	76	73	40	19	9	..	18	118	..
Karnatigiri	81	359	..	68	439	..	62	223	..
Polur Range.									
Tanjar	97	677	..	82	438	..	60	513	..
Periamalai	43	205	..	18	11	..	..	..	..
Pullimedu	15	124	20	16	147	..	20	109	440
Jambumalai	3	10	..	91	759	..	16	51	300
Tiruvannamalai Range.									
Ponnair East	88	314	..	80	450	..	109	947	..
Perunkolathur Swamimalai,	..	..	..	80	91	..	31	535	..

Felling series. (1)	1932-33. Area worked. (28) ACRES.	1932-33. Yield. Fuel. (30) TONS.	1932-33. Yield. Timber. (31) C. FT.	1933-34. Area worked. (32) ACRES.	1933-34. Yield. Fuel. (33) TONS.	1933-34. Yield. Timber. (34) C. FT.	1934-35. Area worked. (35) ACRES.	1934-35. Yield. Fuel. (36) TONS.	1934-35. Yield. Timber. (37) C. FT.
Odagathur Range.									
Naikaneri	95	325	2,920	97	383	620	96	461	360
Panankatteri	124	397	80	113	386	80	107	259	..
Vellakal (Ambur)	..	..	..	..	..	..	..	..	..
Natcharkuppam	41	89	..	58	100	..	46	38	..
Patcharkuppam	..	..	..	..	..	..	53	36	..
Agraram	..	..	..	..	..	..	..	..	..
Kuppampalayam	34	337	80	54	271	42	62	234	240
Pallipattu	49·5	157	..	80	353	..	54	272	400
Kallaparai	..	..	..	..	..	..	..	..	..
Asanampet	76	239	20	..	..	..	84	263	..
Rasimalai	..	..	..	..	..	..	..	..	..
Kuchiguddai	..	..	..	..	..	..	..	..	..
Tattankinar	76	325	..	..	..	..	69	343	..
Komiar	65	129	..	66	192	..	130	352	..
Nellimalai	..	..	..	..	..	..	..	..	..
Varadalampet	..	..	..	..	..	..	..	..	..
Usoor	72	142	..	66	192	..	76	248	..
Kylasagiri	..	..	..	..	..	..	..	..	..
Vellakal (Sholavaram) ..	50	172	..	62	276	..	36	128	..
Thellai	92	528	..	114	579	..	120	597	..
Santavasal Range.									
Karungalthody	83	197	180	73	260	540	62	255	280
Amerdi	33	148	..	12	306	..	20	247	20
Attuparai	17·5	225	60	24	258	..	58·5	227	80
Santavasal	34	347	..	44	503	..	28	150	400
Velamkuppam	35	277	..	22	393	..	30	234	40
Karnatigiri	42	338	..	66	683	440	51	605	520
Polur Range.									
Tanjar	99	638	731	60·5	814	1,300	61	878	..
Periamalai	..	..	..	Sold but not worked.			..	..	..
Pullimedu	3	30	..	12·5	199	640	26·5	141	..
Jambumalai	25	164	120	14	121	..	..	..	..
Tiruvannamalai Range.									
Ponnair East	83	417	..	108	614	..	50	312	..
Perunkolathur Swamimalai,	..	..	..	24·5	74	..	..	..	..

Statement of yield, fuel and small timber, from felling series in the Palar river plantations.

Felling series.	1916–17. Area worked.	Yield. Fuel.	Timber.	1917–18. Area worked.	Yield. Fuel.	Timber.	1918–19. Area worked.	Yield. Fuel.	Timber.	1919–20. Area worked.	Yield. Fuel.	Timber
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	ACS.	TONS.	C.FT.	ACS.	TONS.	C.FT.	ACS.	TONS.	C.FT.	ACS.	TONS.	C.FT.
Virinjipuram	15	59	..	38	45	..	35	7	..	36	20	..
Chenur	26	4	..	..	..	..	..	..	..	26	2	..
Kilminal	24·4	37	..	23	60	..	23	163	..	..	..	..
Tiruvallam	21	25	..	21	64	..	23·5	81	..	34	152	..

Felling series.	1920-21. Area worked.	Yield. Fuel.	Timber.	1921–22. Area worked.	Yield. Fuel.	Timber.	1922–23. Area worked.	Yield. Fuel.	Timber.	1923–24. Area worked.	Yield. Fuel.	Timber.
	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
	ACS.	TONS.	C.FT.	ACS.	TONS.	C.FT.	ACS.	TONS.	C.FT.	ACS.	TONS.	C.FT.
Virinjipuram	17	..	160	32	62	..	33	69	..	26	128	..
Chenur	..	..	..	56	55	..	23	44	..	35	119	..
Kilminal	13·5	..	182	13	25	..	13	38	..	13	216	..
Tiruvallam	31	..	700	34	30	..	33	25	..	19	44	..

Felling series.	1924–25. Area worked.	Yield. Fuel.	Timber.	1925–26. Area worked.	Yield. Fuel.	Timber.	1926–27. Area worked.	Yield. Fuel.	Timber.	1927–28. Area worked.	Yield. Fuel.	Timber.
	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)
	ACS.	TONS.	C.FT.	ACS.	TONS.	C.FT.	ACS.	TONS.	C.FT.	ACS.	TONS.	C.FT.
Virinjipuram	29	98	..	28	40	..	40	52	..	31·5	81	..
Chenur	25	55	..	27	76	..	No further fellings.					
Kilminal	15	46	..	27	35	..	13	43	..	22·5	605	..
Tiruvallam	25	5	..	26	28	..	27	33	..	No demand.		

Felling series.	1928–29. Area worked.	Yield. Fuel.	Timber.	1929–30. Area worked.	Yield. Fuel.	Timber.	1930–31. Area worked.	Yield. Fuel.	Timber.	1931–32. Area worked.	Yield. Fuel.	Timber.
	(38)	(39	(40	(41)	(42)	(43)	(44)	(45)	(46)	(47)	(48)	(49)
	ACS.	TONS.	C.FT.	ACS.	TONS.	C.FT.	ACS.	TONS.	C.FT.	ACS.	TONS.	C.FT.
Virinjipuram	38	351	..	30	327	..	34	272	..	34	187	..
Chenur					No further fellings.							
Kilminal	19	168	..	26·5	108	..	33	251	..	25	79	..
Tiruvallam	24	58	..	22·5	68	..	19	54	..	20	79	..

Felling series.	1932–33. Area worked.	Yield. Fuel.	Timber.	1933–34. Area worked.	Yield. Fuel.	Timber.	1934-35. Area worked.	Yield. Fuel.	Timber.
	(50)	(51)	(52	(53)	(54)	(55)	(56)	(57	(58)
	ACS.	TONS.	C.FT.	ACS.	TONS.	C.FT.	ACS.	TONS.	C.FT.
Virinjipuram	22	89	..	30	103	..	26	187	..
Chenur				No further fellings.					
Kilminal	14	432	..	15	136	..	15	102	..
Tiruvallam	22	143	..	23	207	..	36	187	..

225. *Minor forest produce.*—The yield of minor forest produce for the three years ending 1933–34 is given in the following statement. To facilitate comparison, the various commodities, excluding quarry stone, have been reduced to one common denomination, namely pounds.

Statement showing the yield of Minor Forest Produce for three years ending 1933–34.

Year.	Odagathur Range. Avaram bark.	Konnai bark.	Sural bark.	Nux-vomica.	Other M.F.P.	Quarry stone cart-loads.	Santavasal Range. Avaram bark.	Konnai bark.	Sural bark.	Nux-vomica.	Other M.F.P.	Quarry stone cart-loads.
	LB.	LB.	LB.	LB.	LB.		LB.	LB.	LB.	LB.	LB.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1931–32 ..	4,144	..	..	..	98,865	899	5,625	..	..	..	85,560	..
1932–33 ..	13,104	..	..	..	220,858	1,413	1,375	..	..	9,875	327,274	260
1933–34 ..	37,324	..	..	..	536,103	2,315	1,875	17,565	..	4,175	179,824	237
Annuol average.	**16,191**	..	..	..	**285,275**	**1,542**	**2,958**	**5,855**	..	**4,683**	**197,553**	**166**
	Polur Range.						Tiruvannamalai Range.					
1931–32 ..	500	..	6,000	250	34,461	..	..	..	..	..	48,740	..
1932–33 ..	875	..	..	1,500	174,000	..	63,000	..	..	..	28,500	..
1933–34 ..	..	52,500	..	31,300	104,787	..	..	..	..	..	42,875	..
Annual average.	**458**	**17,500**	**2,000**	**11,017**	**104,416**	..	**21,000**	..	..	..	**40,038**	..

SECTION 6.—PAST REVENUE AND EXPENDITURE.

226. The Vellore East division, as at present constituted, was formed in 1932. It is therefore only possible to furnish figures of revenue and expenditure from that year. They are set forth in the statement below. The figures for 1932–33 are approximate as the division was not formed until 1st December 1932.

Statement showing the Revenue and Expenditure for the three years ending 1934–35.

Year.	Revenue. Sandalwood. Amount.	Sandalwood. Per cent.	Small timber. Amount.	Small timber. Per cent.	Fuel. Amount.	Fuel. Per cent.	Bamboos. Amount.	Bamboos. Per cent.	Grazing. Amount.	Grazing. Per cent.	Minor forest produce. Amount.	Minor forest produce. Per cent.	Miscellaneous. Amount.	Miscellaneous. Per cent.
	RS.		RS.		RS.		RS.		RS.		RS.		RS.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1932–33 ..	26,893	13	11,090	6	28,618	14	60,350	30	26,864	13	31,980	16	20,282	10
1933–34 ..	40,134	20	8,503	4	25,315	13	51,577	26	26,111	13	33,561	17	17,201	9
1934–35 ..	26,796	14	4,896	3	24,419	13	66,247	35	25,237	13	29,738	16	15,193	8
Total for three years.	**93,323**		**24,489**		**78,352**		**1,78,174**		**78,212**		**95,279**		**52,676**	
Annual average for three years.	31,274	**16**	**8,163**	**4**	**26,117**	**14**	**59,391**	**30**	**26,071**	**13**	**31,760**	**16**	**17,559**	**9**

Year.	Refunds. Amount.	Refunds. Per cent.	Total, Revenue less refunds.	Expenditure. Establishment. Amount.	Establishment. Per cent.	Conservancy. Exploitation. Amount.	Exploitation. Per cent.	Improvement and upkeep of forests. Amount.	Improvement and upkeep of forests. Per cent.	Miscellaneous. Amount.	Miscellaneous. Per cent.	Total.	Surplus.
	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)
	RS.		RS.	RS.		RS.		RS.		RS.		RS.	RS.
1932–33 ..	4,661	2	2,01,416	59,984	78	4,049	5	8,637	11	4,593	6	77,263	1,24,153
1933–34 ..	4,325	2	1,98,077	64,876	79	1,778	2	9,150	11	6,132	8	81,936	1,16,141
1934–35 ..	4,480	2	1,88,046	68,716	79	3,013	3	9,042	10	6,518	8	87,289	1,00,080
Total for three years.	**13,466**		**5,87,539**	**1,93,576**		**8,840**		**25,829**		**17,243**		**2,46,488**	**3,40,374**
Annual average for three years.	**4,489**	**2**	**1,95,846**	**64,525**	**79**	**2,947**	**3**	**8,943**	**11**	**5,748**	**7**	**82, 63**	**1,13,458**

CHAPTER VI.—STATISTICS OF GROWTH AND YIELD.

SECTION 1.—SANDAL.

227.—*Growing stock.*—An enumeration carried out over the entire sandal bearing area of the division reveal.

		ACRES
(*a*) The total sandal bearing area	.. ..	53,726
(*b*) Total number of trees enumerated—		
Healthy	.. ..	684,024
Dead	.. ..	10,894
	Total ..	* **694.918**
(*c*) Number of trees per acre—		
Healthy	.. ..	12·7
Dead	.. ..	0·2
	Total ..	**12·9**

* As trees were not measured, it is not possible to give the number of trees under each girth class.

228. *Yield of heartwood per tree.*—The following statement, compiled from the control registers relating to extraction carried out between 1916–17 and 1933–34 in the Santavasal and Polur ranges, shows the average yield of final cleaned sandalwood per tree in the various three-inch girth classes. It has already been stated elsewhere that only dead trees were extracted. It is interesting to note that the yield per tree is appreciably higher in the Polur range. In the other ranges sandal occurs in small patches and up to a few years ago was not considered sufficiently important to justify systematic working.

Girth classes.	Santavasal Range. Number of trees on which averages are based.	Average yield of heartwood per tree. QRS.	LB.	OZ.	Polur Range. Number of trees on which averages are based.	Average yield of heartwood per tree. QRS.	LB.	OZ.	Division. Number of trees on which averages are based.	Average yield of heartwood per tree. QRS.	LB.	OZ.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
9″ and below	100	0	5	7	100	0	5	4	200	0	5	6
Over 9″ to 12″ inclusive	100	0	9	12	100	0	14	3	200	0	12	0
,, 12″ to 15″ ,, ...	100	0	17	15	100	0	18	5	200	0	18	2
,, 15″ to 18″ ,, ...	100	1	4	11	100	1	10	4	200	1	7	8
,, 18″ to 21″ ,, ...	100	1	11	9	100	2	5	12	200	1	22	11
,, 21″ to 24″ ,, ...	100	2	14	7	100	3	8	8	200	2	25	8
,, 24″ to 27″ ,, ...	100	3	17	2	100	4	8	7	200	3	26	13
,, 27″ to 30″ ,, ...	100	4	19	15	100	5	24	10	200	5	8	5
,, 30″ to 33″ ,, ...	100	6	2	10	100	7	13	5	200	6	22	0
,, 33″ to 36″ ,, ...	100	7	2	10	71	9	5	6	171	7	27	0
,, 36″ to 39″ ,, ...	36	8	0	13	46	10	11	15	82	9	10	7
,, 39″ to 42″ ,, ...	12	8	27	10	10	9	15	6	22	7	5	8
,, 42″ to 45″ ,, ...	8	7	8	10	3	9	16	3	11	7	25	15
,, 45″ to 48″ ,, ...	6	15	9	3	1	22	10	0	7	16	9	5
,, 48″ to 51″ ,, ...	2	12	7	0	..	..	..	..	2	12	7	0
,, 51″ to 54″ ,, ...	3	14	10	8	2	24	19	8	5	18	14	2
,, 54″ to 57″ ,, ...	1	2	0	0	..	..	..	..	1	2	0	0
,, 57″ to 60″ ,,	1	1	25	8	..	..	..	..	1	1	25	8

229. *The ratio of diameter to yield of heartwood* is expressed in the graph on the opposite page which has been drawn from figures recorded in columns 1, 11, 12 and 13 of the foregoing statement. Girth classes above 39 inches have been omitted as the number of trees in each are insufficient for the production of accurate data.

230. *Yield of heartwood per acre.*—The average yield of heartwood per acre obtained n the Santavasal and Polur ranges during two complete felling cycles of the last plan works out to 11 lb. 9 oz. and 16 lb. 3 oz. respectively. In working out these averages non-sandal areas, which were included in coupes for convenience of working, have been omitted. Actually three complete felling cycles were gone through but the first of these has not been taken into account as it is probable that there was an accumulation of dead trees in the coupe when operations commenced in accordance with the prescriptions of the last plan.

231. *Mortality in sandal.*—The following statement gives the mortality per cent of sandal in its transition from one diameter class to another. The number of living trees in each diameter class (column 2) has been extracted from Appendix VI (Reserves only) of Mr. C..C. Wilson's Sandalwood Working Plan for the Javadi and Yelagiri Hills. The periods of transition from one diameter class to another (column 4) have been obtained from graph No. 4 in Appendix X of the same plan.

Calculation of mortality per cent.

Diameter classes (in inches).	Number of living trees in the diameter class.	Gross mortality in transition to higher diameter class.	Period of transition from one diameter class to the next (years).	Annual mortality in transition.	Annual mortality per cent expressed against lower diameter class.
(1)	(2)	(3)	(4)	(5)	(6)
3	1,16,247				
		29,126	4½	6,472	5·57
4	87,121				
		24,245	4	6,061	6·96
5	62,876				
		15,090	4	3,773	6·00
6	47,786				
		19,839	4	4,960	10·38
7	27,947				
		9,328	4½	2,073	7·42
8	18,619				
		7,105	5½	1,292	6·94
9	11,514				
		6,034	8	755	6·56
10	5,480				
		1,795	11	163	2·97
11	3,685				

The uniformity in the annual mortality per cent throughout the period, with the exception of that which takes place from the 6 to 7 inch and 10 to 11 inch diameter classes, is striking. The mortality during the transition from the 10 to 11 inch diameter classes should not be regarded as accurate as the length of the period, 11 years, is only an interpolation from the incomplete end of the age-diameter curve. The comparatively high mortality occurring between the 6 to 7 inch diameter class is curious and it is interesting to note that in the case of North Salem there is also a rise in the mortality per cent at this stage.

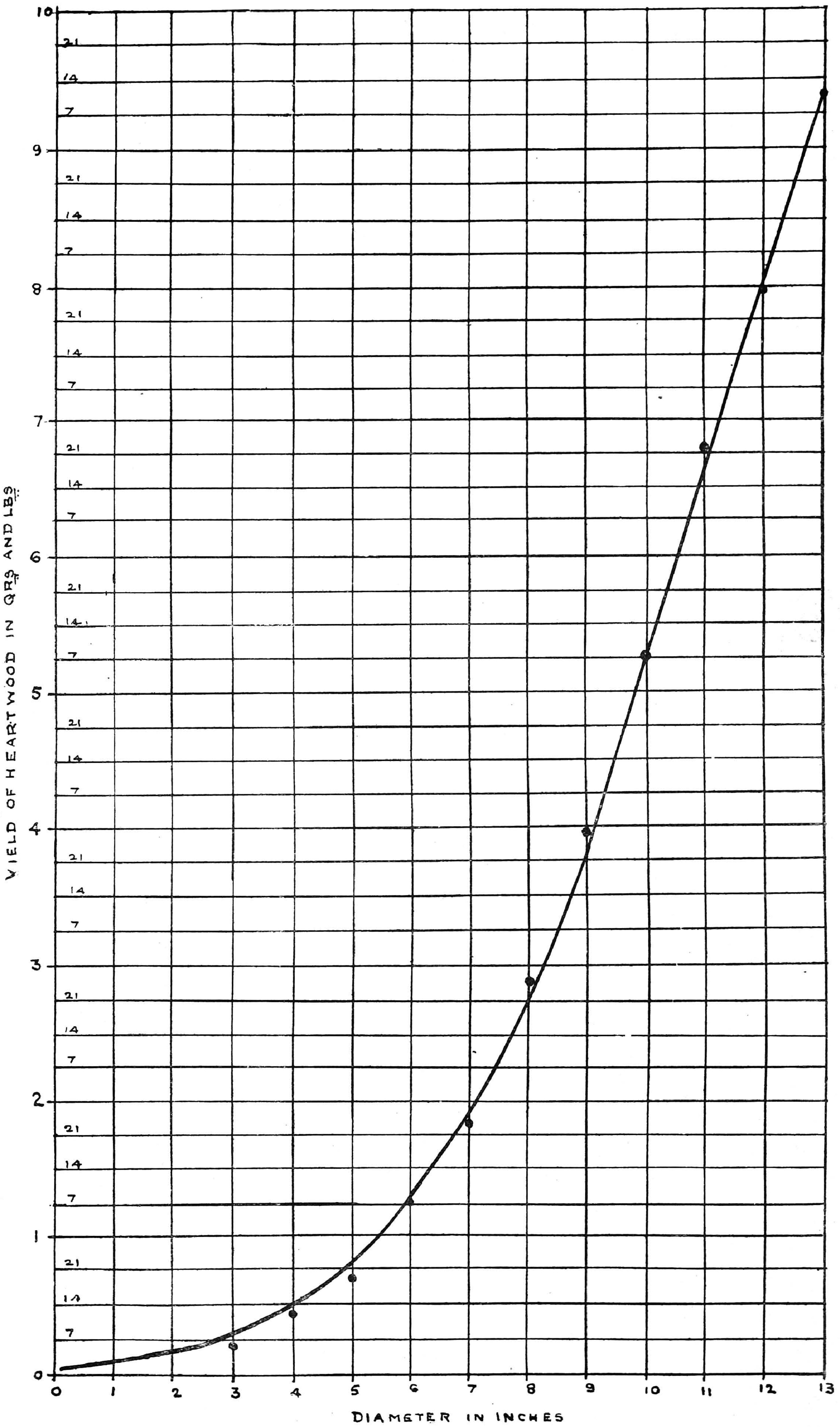
SECTION 2.—FUEL SPECIES.

232. *Rotation.*—The coppice re-growth in the oldest coupes worked hitherto on a 30-year rotation is disappointing. An increase in the rotation is indicated.

233. An attempt to collect figures as a guide to the determination of the correct rotation was made by taking height and girth measurements of some 5,000 coppice shoots of representative species in 62 coupes in four localities covering a range of ages from 15 to 35 years. An abstract of the figures is given below.

Age of coppice in years.	Average number of shoots per stool.	Average measurements of the most vigorous shoot.		Age of coppice in years.	Average number of shoots per stool.	Average measurements of the most vigorous shoot.	
		Girth in inches.	Height in feet.			Girth in inches.	Height in feet.
(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
15	4·0	5·0	16·0	26	3·3	9·0	15·9
16	3·5	6·8	16·4	27	2·8	10·1	16·7
17	3·4	6·4	15·7	28	2·6	9·7	14·7
18	3·7	6·6	16·0	29	1·9	13·0	16·2
19	4·2	7·5	16·2	30	3·2	13·2	18·0
20	3·6	7·0	16·6	31	4·0	9·2	17·6
21	3·3	7·5	16·3	32	3·6	9·4	17·0
22	3·1	8·2	16·0	33	5·1	10·5	19·1
23	3·0	8·6	16·0	34	3·8	11·9	21·0
24	3·0	9·0	16·0	35	3·7	11·9	21·0
25	3·4	8·7	15·5	..	..	..	..

It cannot be claimed that these figures help in leading us to a definite conclusion. They are too inconsistent, but the adoption throughout the Fuel Working Circle, except in the two Palar plantation felling series, of the longer of the two rotations now in force—that is 40 years—is clearly indicated on general grounds. In the two Plantation felling series a rotation of 30 years is considered sufficiently long.



YIELD OF HEARTWOOD IN QRS AND LBS
DIAMETER IN INCHES
0
1
2
3
4
5
6
7
8
9
10
11
12
13
7
14
21

PART II.

Future management discussed and prescribed.

CHAPTER I.—BASIS OF PROPOSALS.

SECTION 1.—GENERAL OBJECTS OF MANAGEMENT.

234. *The objects of management* may be summarized as follows :—

(i) To regularise the realization of revenue, so as to obtain as far as possible an equal annual yield by the systematic exploitation of the existing crop of sandal, bamboos, fuel and minor forest produce.

(ii) To exploit all dead sandal trees at regular intervals so as to obtain the maximum yield of heartwood per acre.

(iii) To regulate the supply of fuel and bamboos with reference to the requirements of neighbouring towns and villages.

(iv) To make available for agricultural and domestic needs such small timber as the forests, in their present state, are capable of producing.

(v) To control and facilitate grazing and the cutting and removal of green leaves for manure so that the maximum protection to the forest is afforded without prejudice to the requirements of the population.

(vi) To protect and, wherever possible, to improve the existing growing stock, whether of sandal or other species, by such silvicultural operations as are indicated and are practicable.

(vii) To realize such other revenue as may be legitimately obtained from the forest.

235. Thus, it is seen that the prescriptions which follow provide for the exploitation, conservation and improvement of the forest and, at the same time, seek to discharge the obligations of the state to the people.

SECTION 2.—METHODS OF TREATMENT TO BE ADOPTED.

236. The following methods of treatment will be adopted in the various types of forest :—

(i) *Sandal.*—Improvement felling involving the extraction of dead trees only.

(ii) *Fuel and small timber.*—Simple coppice with reservation of sound minor forest produce yielding trees. The rotation will be 40 years except in the case of the Palar river plantations where 30 years will be adopted. Blanks and poorly stocked areas will be regenerated with suitable species in '*rab*' * lines running along contours and interrupted at good coppice stools.

(iii) *Bamboos.*—The bamboo areas will be worked on a three-year rotation. The system of triennial leases now in force has much in its favour, but in certain circumstances annual leases are preferable. The decision as to which should be adopted in the future will be left to the District Forest Officer who should consult the Conservator before making a change in this respect. When however flowering commences in any series it will be better if the coupes are sold annually and selected according to the intensity of flowering. Coupes which have flowered will be excluded from working until the new crop becomes saleable. The District Forest Officer will be given the discretion of selling bamboos departmentally should there be no competition at the sales owing to a small number of bidders, or if he is opposed by an organized ring.

(iv) *Minor forest produce.*—The present system of selling by farms in auction annually will continue. The District Forest Officer may however combine two or more farms should a demand arise, or sell on a biennial lease products which have a commercial value, such as barks and nuxvomica.

(v) *Green leaf manure.*—The present system of removals under permit will continue. Removals should however be restricted to localities in which there is a demand and prohibited in areas set apart for the production of wood, i.e., the sandal and fuel felling series.

(vi) *Grazing.*—Grazing will continue on payment of the rates sanctioned by Government from time to time and provision made to meet the full grazing requirements of villages dependent on the reserves for pasture.

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* Dibbling seeds in the ash of burnt heaps of debris.

SECTION 3.—WORKING CIRCLES, THEIR AREA AND DISTRIBUTION—REASONS FOR THEIR CONSTITUTIONS.

237. In pursuance of the objects of management set forth in section 1 above, six working circles have been prescribed. They are :—

(i) *The Sandal Working Circle.*—113,068 acres in extent is comprised of all the sandal bearing areas of the division.

(ii) *Fuel and Small Timber Working Circle.*—54,975 acres in extent, includes all accessible fuel areas within economic working distance of local markets.

(iii) *The Bamboo Working Circle.*—189,770 acres in extent, covers the whole of the bamboo forest in the division.

(iv) *The Minor Forest Produce Working Circle.*—Covers the whole division.

(v) *Green Leaf Manure Working Circle.*—17,580 acres comprising twelve blocks situated in localities where the demand of villages is not met by supply from neighbouring panchayat reserves.

(vi) *Grazing Working Circle.*—Covers the whole division with the exception of the Banavaram reserve, the Ambur and the seven Palar river plantations. The area open to grazing will vary from year to year as fuel coupes will be closed in the year of felling and for six years thereafter.

SECTION 4.—PERIOD OF WORKING PLAN AND THE NEXT REVISION.

238. *The period covered by this plan* is ten years, 1st April 1936 to 31st March 1946.

239. *The next revision.*—After this plan had been completed and sent to the press, it was decided that working plans should be written for fifteen years. and not for ten as has been customary hitherto. It will be a simple matter to extend the prescriptions of this plan, in due course, for a further period of five years, as no extra stockmapping will be necessary, the present series of sandal and bamboo coupes continuing in sequence, while new fuel coupes can, without difficulty, be prescribed with reference to previously worked areas, which are shown on the fuel working map. Modifications in the silvicultural systems will have been dealt with by amendments from time to time and, perhaps, all that will be required would be a few minor readjustments of area.

CHAPTER II.—WORKING PLAN FOR THE SANDAL WORKING CIRCLE.

SECTION 1.—GENERAL CONSTITUTION OF THE WORKING CIRCLE, AREA AND CHARACTER OF THE VEGETATION.

240. *General constitution and area.*—The Sandal Working Circle embraces all sandal-bearing areas in the reserves of the division and the following enclosures.

(*a*) The sandal-bearing enclosures on the Javadi Hills in the Vellore, Santavasal and Polur ranges.

(*b*) The unassessed lands and porambokes in the Akkarapatti village on the Kalroyan Hills of the Tiruvannamalai range.

The greater portion of the working circle lies on the Javadi plateau. The aggregate area is 113,068 acres, constituted as follows :—

Range.	Area of sandal in Reserves, ACRES.	Area of sandal in Enclosures. ACRES.	Area of working circle. ACRES.
(1)	(2)	(3)	(4)
Vellore	7,340 *	1,359	
Odagathur	416	..	
Santavasal	25,338 *	12,157	
Polur	47,409	10,386	
Tiruvannamalai	8,553	110	
Totals ..	**89,056**	**24,012**	**113,068**

* 130 acres comprising parts of coupes III and IV of the Thongamalai Felling Series have been transferred from the Santavasal to the Vellore range with effect from 1st September 1936, consequent to the alteration of the common boundary between these two ranges.

241. *Character of the vegetation.*—The composition and condition of the crop have been fully described in Chapter II of Part I, so a few brief remarks here with reference to sandal will suffice.

242. The sandal on the Javadis is generally well grown and healthy, while that in the plains is mostly of small size and not so vigorous. On the Javadis the best growth of sandal is often found in, or on the fringes of, high bamboo forest—*Bambusa arundinacea.*

243. In certain areas in plains forest where fuel is of primary importance, but where sandal also occurs, the Sandal and Fuel Working Circles overlap. The situation of such areas can be located on the key map (burnt sienna lines overlapping the yellow wash) and

further studied by placing the sandal and fuel working maps side by side. Where this overlapping occurs the development of the sandal should be carefully watched and at the next revision of the plan, if conditions justify it, fuel working should be discontinued and preference given to sandal.

SECTION 2.—ANALYSIS AND VALUATION OF THE CROP.

244. The sandal in the *reserves* was stock-mapped by an adaptation of the timber cruising method. The reserves were divided into a number of compartments by means of natural or permanent artificial boundaries. Compartments were subdivided into strips, five chains wide, running either north and south or east and west. Strip lines were not cleared, but were indicated on the ground by blazing trees and cutting occasional bushes so that they could be followed without difficulty. All sandal trees above the height of a man, 5 feet 6 inches, were then counted along each strip and marked in on field sheets (enlarged to a scale of 16 inches to 1 mile from 4-inch Survey of India maps) at intervals of 10 chains. The stockmapping thus proceeded in small units of 5 acres each. The following density classes were shown :—

Over 30 trees per acre.	11 to 20 trees per acre.
21 to 30 ,, ,,	6 to 10 ,, ,,
	5 trees and below.

These details were reduced and transferred to a blank set of 4-inch Survey of India maps which have been filed for permanent record.

245. As the situation of *enclosures* is marked on the working maps, and as each enclosure will be visited either annually or biennially, and dead trees extracted, it was not considered necessary to enter into an analysis of the sandal growing in them. Further such analysis would have entailed much time and considerable expenditure.

SECTION 3.—METHOD OF TREATMENT.

246. *Silvicultural system.*—The only valuable part of a sandal tree is the scented heartwood, which is used chiefly for the distillation of sandal-oil. The oil content is higher in the roots than in the aerial portions of the tree, so exploitation necessarily involves uprootal. The production of heartwood commences at an early age and marketable heartwood may generally be found in trees of 6 inches in girth and over. As the value of heartwood lies in its oil content, the size of the trees extracted is of no practical importance, except that it may be taken as an indicatior cf the probable outturn ct heartwood —vide graph in paragraph 229 above.

247. Hitherto only dead sandal trees have been extracted. The necessity for removing living trees need not be considered at present as the natural mortality in all girth classes produces a yield of heartwood which is sufficient to meet the demand. If however it is found that the mortality per cent continues to decrease, as it appears to be doing (vide paragraph 253 below), it may become necessary, at the next revision of the plan, to prescribe the extraction of living trees on the basis cf an exploitable size.

248. The system applied will be *a modification of the selection system* and will consist in the removal of dead trees only, and in the maintenance and improvement of the growing stock by rigid protection and tending operations.

249. *Division of the area into felling series.*—The working circle, excluding the area of enclosures, is divided into nine felling series. Owing to the patchy distribution of sandal and the need for adopting as far as possible natural features for coupe boundaries, it has been necessary to include within the limits of felling series considerable areas containing no sandal. To facilitate working, the extent and distribution of the species is shown on the sandalwood working maps. Details of area are set forth in the following statement :—

Serial number.	Felling series.	Range.	Area, acres. Sandal.	Non-sandal.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
1	Alleri	Vellore	5,097	2,659	7,756
2	Amerdi	Santavasal	5,809	1,691	7,500
3	Thongamalai	Do.	* 4,349	1,587	5,936
4	Nadanur	Do.	4,464	7,438	11,902
5	Veerappanur	Polur	6,269	2,821	9,090
6	Komattiyur	Do.	5,568	1,246	6,814
7	Patrakad	Do.	10,016	5,784	15,800
8	Moolakad	Do.	9,456	6,249	15,705
9	Tiruvannamalai	Tiruvannamalai	2,700	5,853	8,553
		Total ..	**53,728**	**35,328**	**89,056**

* 130 acres have been t nsferred to the Vellore range with effect from 1st September 1936 consequent to the alteration of the common boundary between t Santavasal and Vellore ranges.

250. The total area of enclosures in each range has been given in paragraph 240 above and the area of each enclosure is furnished in the tabular statement of operations—paragraph 260 below.

251. *Felling cycle.*—A felling cycle of six years will be adopted for the reserves. Enclosures will be examined, and dead trees extracted, annually, or biennially where the aggregate area falling within the jurisdiction of a forester is too large to be gone through in one year. The reason for working enclosures annually or biennially is to ensure the prompt extraction of trees which are, for the most part, growing in cleared fields, either under cultivation or lying fallow.

252. *Allocation of coupes.*—Each felling series has been divided into six coupes, one of which will be worked in sequence every year. The old division into coupes in the Santavasal and Polur ranges has, as far as possible, been adhered to. At the same time an endeavour has been made to divide up each series with reference to density classes so that the coupes in it may be equiproductive. It is however very doubtful if this state can be attained in practice. A perusal of the yield figures in paragraph 222 above shows how very unequal yields are, even in two successive extractions in the same coupe.

253. *Calculation of the yield.*—The annual yield depends on the number of trees which die each year and the quantity of heartwood obtained from them. It is impossible to estimate the former exactly ; and it is a well-known fact that the heartwood content of individual trees is variable. It is seen from the statement at paragraph 222 above that the yields for the Santavasal and Polur ranges during the first two felling cycles of the last working plan were approximately equal, while that for the third and last cycle was almost 40 per cent less than that of the preceding one. From this it would seem that the mortality per cent is decreasing, and that the decrease is due to the more favourable conditions of growth induced by successful fire protection and tending. Simultaneous with this decrease in the mortality per cent the actual stocking has increased from 9·3 trees per acre in 1915 to 12·5 trees per acre in 1935. Thus, it would not be correct to calculate the future yield by the usual method of applying the average annual mortality per cent to the growing stock. The only other way in which a forecast of the future yield can be made is by adopting the average annual yield for the last cycle. This has been done below for the Santavasal and Polur ranges. In the case of the Vellore and Tiruvannamalai ranges, extraction commenced in 1933–34, so the average is based on the yields of three years only. It must however be remembered that the figures furnished are only approximate and should be regarded as an indication rather than an estimate. As yield figures are not available for reserves and enclosures separately both have been dealt with together.

Anticipated average annual yield, including enclosures.

	TONS.
(i) Santavasal and Polur ranges	47·93
(ii) Vellore range	1·24
(iii) Tiruvannamalai range	0·51
Total for division ..	**49·68** or **50** tons.

SECTION 4.—METHOD OF EXECUTING FELLINGS.

254. *Regulation of operations.*—All operations connected with the exploitation of sandal will be carried out departmentally, one coupe in each felling series and a definite area of sandal bearing enclosures being exploited every year. The sequence of coupes and the positions of the enclosures are shown on the sandal working maps and the years of extraction are given in the tabular statement of fellings in section 5 below. Enclosures are denoted by the names of villages situated in them.

255. *Clearing coupe boundaries.*—Natural and permanent artificial features and lines already existing on the ground have, as far as possible, been selected for coupe boundaries. Where this has not been done, lines 10 feet wide will be cleared for each coupe in the year prior to felling. This will cost about Rs. 6 per mile and the annual expenditure will vary from year to year and will continue until 1940–41. As exploitation during 1936–37 will be in accordance with the prescriptions of this plan, and as the coupe lines for the year have not been cleared, it will be necessary to clear the lines for two sets of coupes during 1936–37.

In the second felling cycle coupe boundaries will be recleared at a cost not exceeding Rs. 3 per mile. The following statement gives the length to be cleared each year and the estimated expenditure :—

Year. (1)	Range. (2)	Felling series. (3)	Coupe number. (4)	Length of line to be cleared in miles (to first decimal place). (5)	Estimated expenditure at Rs. 6 per mile. Coupe. (6)	Range. (7)	Division. (8)
					RS. A.	RS. A.	RS. A.
1936–37 ..	Vellore	Alleri	III	6·9*	41 6	..	..
			IV	0·5	3 0	44 6	..
	Santavasal ..	Thongamalai ..	III	0·3	1 13	..	..
			IV	1·4	8 6	..	..
		Amerdi	III	7·3	43 13	..	..
		Nadanur ..	IV	1·3	7 13	61 13	..
	Polur	Veerappanur ..	III	1·3	7 13	..	..
			IV	0·7	4 3	..	..
		Patrakad ..	III	3·5	21 0	..	..
		Moolakad ..	III	2·2	13 3	46 3	..
	Tiruvannamalai.	Tiruvannamalai.	III	1·6	9 10	..	..
			IV	0·3	1 13	11 7	163 13
1937–38 ..	Vellore	Alleri	V	3·8	22 13	22 13	..
	Santavasal ..	Nadanur ..	V	10·8	64 13	64 13	..
	Polur	Veerappanur ..	V	4·1	24 10	..	..
		Moolakad ..	V	2·4	14 6	39 0	..
	Tiruvannamalai.	Tiruvannamalai.	V	4·8	28 13	28 13	155 7
1938–39 ..	Vellore	Alleri	VI	7·8	46 13	46 13	..
	Santavasal ..	Thongamalai ..	VI	1·1	6 10	..	..
		Amerdi	VI	0·5	3 0	..	..
		Nadanur ..	VI	18·0	108 0	117 10	..
	Polur	Veerappanur ..	VI	1·9	11 6	..	..
		Patrakad ..	VI	1·9	11 6	..	..
		Moolakad ..	VI	5·2	31 3	53 15	..
	Tiruvannamalai.	Tiruvannamalai.	VI	2·0	12 0	12 0	230 6
1939–40 ..	Vellore	Alleri	I	3·4	20 6	20 6	..
	Santavasal ..	Thongamalai ..	I	2·0	12 0	..	..
		Amerdi	I	0·4	2 6	14 6	..
	Polur	Veerappanur ..	I	0·3	1 13	..	..
		Komattiyur ..	I	4·0	24 0	..	..
		Patrakad ..	I	2·4	14 6	..	..
		Moolakad ..	I	7·0	42 0	82 3	..
	Tiruvannamalai.	Tiruvannamalai.	I	0·7	4 3	4 3	121 2
1940–41 ..	Vellore	Alleri	II	2·1	12 10	12 10	..
	Santavasal ..	Thongamalai ..	II	1·2	7 3	..	..
		Amerdi	II	3·3	19 13	..	..
		Nadanur ..	II	0·1	0 10	27 10	..
	Polur	Veerappanur ..	II	0·3	1 13	..	..
		Komattiyur ..	II	0·5	3 0	..	..
		Patrakad ..	II	0·9	5 6	..	..
		Moolakad ..	II	2·4	14 6	24 9	..
	Tiruvannamalai.	Tiruvannamalai.	II	2·0	12 0	12 0	76 13
			Total ..	124·6	..	..	747 9

* 1·1 mile lies in the Odagattur Range but, as this is the only portion of the Alleri series which lies outside the Vellore range clearing of the total length will be done by the Range Officer, Vellore.

256. *Exploitation.*—Extraction will be confined to dead trees, both standing and fallen, including all stumps and roots. All green fallen or broken stems and branches will also be removed. Details of the procedure to be followed in cleaning, classification and disposal are contained in the Standard Sandalwood Extraction Rules.

257. *Minimum exploitable size.*—As the heartwood content of individual trees is so very variable, it is considered inadvisable to prescribe a minimum girth limit for extraction. Trees which are found to contain no heartwood should not be despatched to the sale depot and no root that contains heartwood of more than the size of half a rupee should be left in the ground.

258. *Restriction of output.*—As exploitation will be regulated entirely by area no limit is imposed on the annual output. Should, however, market conditions indicate a restriction the necessary regulation will be issued under the orders of the Chief Conservator.

SECTION 5.—TABULAR STATEMENT OF FELLINGS TO BE MADE.

259. *Coupes.*—The following statement shows the coupes to be worked each year in the different felling series :—

Year.	Coupe number.	Vellore range.		Santavasal range.						Polur range.								Tiruvannamalai range.		Division.	
		Alleri F.S.		Thongamalai F.S.		Amerdi F.S.		Nadanur F.S.		Veerappanur F.S.		Komattiyur F.S.		Patrakad F.S.		Moolakad F.S.		Tiruvannamalai F.S.			
		Area, acres.		Area, acres.		Area, acres.		Area, acres.		Area, acres.		Area, acres.		Area, acres.		Area, acres.		Area, acres.		Area, acres.	
		Sandal.	Non-sandal.	Sandal.	Non-sandal.	Sandal.	Non-sandal.	Sandal.	Non-sandal.	Sandal.	Non-sandal.	Sandal.	Non-sandal.	Sandal.	Non-sandal.	Sandal.	Non-sandal.	Sandal.	Non-sandal.	Sandal.	Non-sandal.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
1936-37	III	891	741	*803	*232	1,405	605	445	424	1,020	313	768	..	2,949	2,293	1,770	112	345	243	10,396	4,963
1937-38	IV	553	268	*689	*174	1,034	24	725	1,034	1,044	356	1,006	2	1,334	1,275	1,364	1,349	419	501	8,168	4,983
1938-39	V	892	369	687	433	846	9	854	3,140	516	373	576	34	1,325	581	1,374	850	602	631	7,672	6,420
1939-40	VI	845	613	786	362	927	116	1,408	2,395	1,666	593	826	556	1,130	154	1,926	1,384	216	1,928	9,730	8,101
1940-41	I	517	449	804	199	881	562	542	304	843	702	1,563	617	2,009	1,433	1,868	1,737	712	1,906	9,739	7,909
1941-42	II	1,399	219	580	187	716	375	490	141	1,180	484	829	37	1,269	48	1,154	817	406	644	8,023	2,952
1942-43	As for 1936-37.																				
1943-44	As for 1937-38.																				
1944-45	As for 1938-39.																				
1945-46	As for 1939-40.																				

F.S. = Felling series.

* *Note.*—40 acres sandal and 27 acres non-sandal in coupe III and 12 acres sandal and 51 acres non-sandal in coupe IV have been transferred to the Vellore range with effect from 1st September 1936 consequent to the alteration of the common boundary between the Santavasal and Vellore ranges.

260. *Enclosures.*—The following enclosures will be examined and dead trees extracted :—

Enclosure. Name. (1)	Area, acres. (2)	Each forester. Total area, acres. (3)	Headquarters. (4)
(a) Annually.			
Vellore range—			
1 Yerikollai	12	397	Anikut.
2 Karapanankollaiur	12		
3 Nellimarathukollai	6		
4 Nameless, west of No. 3	7		
5 Alleri	286		
6 Marudavallimodur	34		
7 Avacherikollai	39		
8 Katarikollai	1		
1 Jarathukollai	870	962	Sholavaram.
2 Yerimodu	92		
Santavasal range—			
1 Yelavandapudur	419	1,612	Amerdi.
2 Nikkini	178		
3 Selathumadiki	220		
4 Chinnanur	267		
5 Sinnapanaparai	45		
6 Niplampathi	127		
7 Amerdi	28		
8 Palaparampattu	40		
9 Sathampattu	54		
10 Nameless, between Thavaraimarathur and Nikkini.	10		
11 Thavaraimarathur	160		
12 Kolayam	64		
1 Boganur	100	526	Santavasal.
2 Nellimandai	8		
3 Periayavali	126		
4 Thumbakadu	292		
Polur range—			
1 Jonur	20	2,577	Burgur.
2 Nameless, north-east of Natchakkallu hill.	20		
3 Melmarathur	28		
4 Mandaparai	256		
5 Nameless, east of Mandaparai	24		
6 Nameless, between Mandaparai and Jadayanur.	17		
7 Jadayanur	22		
8 Nameless, between Jadayanur and Veerappanur.	8		
9 Veerappanur, etc.	1,710		
10 Pudupattu	472		
1 Kilchepalli	72	241	Athimur.
2 Palveri	113		
3 Kilthattiyapattu	56		
1 Odamangalam	243	1,438	Patrakad.
2 Thumbakollai	67		
3 Periamalai	59		
4 Koilanur (part)	151		
5 Pattankoil	18		
6 Kuttankarai	152		
7 Manjuthu, etc.	290		
8 Kollathur	72		
9 Patrakad	34		
10 Pudur, Mamarathur	32		
11 Melchapalli	53		
12 Kolleri	9		
13 Kondikallur	37		
14 Ambattankollai	49		
15 Vedatope	54		
16 Nameless, west of Vedatope	10		
17 Iramayanur	34		
18 Pelavadi	74		

Enclosure.		Each forester.		
		Total area, acres.		
Name.	Area, acres.	1st, 3rd, 5th, 7th and 9th years.	2nd, 4th, 6th 8th and 10th years.	Headquarters.
(1)	(2)	(3)	(4)	(5)
(b) Biennially.				
Santavasal range—				
1 Nameless, north of Elluparai ..	8			
2 Elluparai	41			
3 Nameless, south of Elluparai ..	10	2,586	..	
4 Puduparai	16			
5 Nayakanur, Muthanur, etc. ..	2,511			
1 Thongamalai	1,180			Thongamalai.
2 Sinnakottansetty and Periakottansetty.	175			
3 Melpadukuppam	12	..	1,558	
4 Koraimadavu	57			
5 Kudikam	134			
1 Periapanaparai	160			
2 Nadanur (part), north of Kalimadugu ar.	1,454			
3 Palathur	154			
4 Nagalur	146			
5 Vedippankoil	28			
6 Nameless, west of Vedippankoil ..	10			
7 Elandampattu	60	2,950	..	
8 Murukumandai	74			
9 Puliyankuppam	458			
10 Melkanavaur	152			
11 Kilkanavaur	36			Nadanur.
12 Eriyur	48			
13 Pudupattuvali	20			
14 Valethumbe	150			
1 Nadanur (part), south of Kalimaduguar.	2,925	..	2,925	
Polur range—				
1 Komattiyur	2,492			
2 Koilanur (part)	35	2,961	..	
3 Mullipattu	170			
4 Athiyanur	264			Komattiyur.
1 Nellimarathur, Koilur, Athipattu, etc.	3,169	..	3,169	

SECTION 6.—SUBSIDIARY SILVICULTURAL REGULATIONS.

261. *Tending.*—Hitherto tending has been done at the time of enumeration, the expenditure incurred being about half anna per acre. The total amount involved has not been very large, but as thousands of acres are gone over every year it is not negligible. It is believed that sandal can push its way through all ordinary cover and the operation is often a waste of time and money. The subject was discussed at the 1937 Conservators' Conference and the following resolution passed :—

> *Resolution VII—Tending of sandal.*—Resolved that in many sandal forests tending is unnecessary, though in certain cases some form of tending is advisable, for instance, cutting climbers where they are harmful and in the preparation of working plans for sandal districts special prescriptions must be included as to the extent of tending that is required and the areas where it should be done, if any.

262. No general tending is therefore prescribed. Creepers are nowhere really very bad, and the isolated cases which there are (usually *Acacia intsia*) can be dealt with by the marking coolies at the time of enumeration.

263. *Artificial regeneration.*—Generally speaking no propagation work is required. The forests as a whole are likely to be overproducing sandal and the energies of the staff can be better employed in tending existing growth than in laying out artificial propagation centres.

SECTION 7.—OTHER REGULATIONS.

264. *Fire protection.*—The Sandal Working Circle is so extensive that the question of the general fire protection of sandal areas is the same as that of the division as a whole and is dealt with in Chapter VIII (Miscellaneous Regulations). Special provision must however be made for sandal growing in dense bamboo forest on the Javadi plateau, where the bamboo has begun to flower and die. There is grave danger, should fire get into such areas, of the sandal trees being very severely damaged or killed. Many of the large sandal trees date back beyond the life of the present bamboo crop and there is evidence to show that fires must have been successfully excluded when the last flowering of bamboo took place and this is confirmed by the statements of local Malayalees, who recollect that severe fires occurred on the outer slopes but that none entered the plateau.

265. The overlapping of sandal and bamboo is marked in the Key Map accompanying this plan by alternating green and yellow horizontal lines. Localities where sandal occurs in dense bamboo forest are clearly shown in the sandal working maps. The density of the sandal and the centres of bamboo floweiing aie also shown.

266. It is not possible at this stage to frame hard-and-fast prescriptions for the protection, from fire, of sandal in such localities ; but the bamboo flowering centres should be carefully watched and when danger does arise in any particular locality it should be protected by a 30 feet wide fire line all round. This will cost Rs. 15 a mile. As the rate at which the flowering spreads and the direction of the spread are very variable, it will not be possible to estimate in advance, accurately, the area to be protected annually. It is therefore prescribed that a sum of Rs. 1,000 be asked for year by year, until the risk from fire disappears, and surrendered, either in whole or in part, as soon as it becomes known what amount is actually required. In this way the division will always be prepared to meet the risk when it does come.

267. *Measures for prevention of the spread of spike disease.*—As already stated in paragraph 89 above, the division is practically free from spike, only eight cases having been discovered up to the present and these in the specially protected block near the Patrakad rest-house. Nevertheless, the importance of detecting fresh attacks immediately they occur, and reporting them at once, should be impressed on all subordinates and severe disciplinary action should be taken in cases where this is not done. Prompt steps should be taken to isolate the infected trees by clearing a 20 feet wide line all round them at a distance of 10 to 100 yards, depending on the severity of the attack, and to prevent the further spread of the disease within the isolated area by

(*a*) Girdling all spiked sandal trees and painting the rings with Atlas solution,
(*b*) Lopping all apparently healthy sandal trees and
(*c*) Girdling all lopped trees, which subsequently exhibit symptoms, and painting the rings with Atlas.

As the trees die, the heartwood should be exploited in the ordinary way.

268. These prescriptions should be altered from time to time in the light of further research ; and for this reason, the District Forest Officer should keep in frequent touch with the Provincial Silviculturist.

269. *Retail sales.*—The present system of selling large lots in auction annually precludes local people from obtaining small quantities readily and may, possibly, be an incentive to theft from the forest. An endeavour should be made to introduce retail sales, at first on a small scale, and later to develop them as the demand increases. The annual festival at Tiruvannamalai affords a very favourable opportunity. It is therefore suggested that the following system, based on the prescriptions contained in paragraph 456 of the working plan for the Coimbatore North division, be tried.

270. The District Forest Officer will obtain from the sale depot at Tiruppattur from time to time quantities of sandalwood billets, 6 to 12 inches in girth and 9 to 12 inches in length, for distribution to Range Officers, for private sale, as follows :—

Range Officer, Vellore	200 billets.
Range Officer, Odagathur	100 ,,
Range Officer, Santavasal	100 ,,
Range Officer, Polur	100 ,,
Range Officer, Tiruvannamalai	250 ,,

No single billet should exceed 5 lb. in weight and the quantities noted above should be regarded as the maximum which each Range Officer can have in his custody.

271. Each billet will be numbered and weighed before it leaves the sale depot and its number and price marked on it in indelible pencil. The price will be calculated at the rate per ton of sandalwood fixed by the Chief Conservator of Forests from time to time

and shall be rounded off to the nearest anna. The prices so fixed will not be subject to reduction on account of dryage during storage. Every billet will be stamped at both ends with the District Forest Officer's hammer.

272. A list showing the serial numbers, weights and prices of the billets will accompany each consignment. A stock register shall be maintained by each Range Officer. The register will show the serial numbers, weights and prices of the billets, dates of receipt and disposal and the names of the purchasers. A minimum stock of 25 billets will be kept by each Range Officer.

273. Should these retail sales develop so that the extra work involved is more than the Range officers can manage, it is suggested that sales be conducted on a commission basis through the agency of contractors.

CHAPTER III.—WORKING PLAN FOR THE FUEL AND SMALL TIMBER WORKING CIRCLE.

SECTION 1.—GENERAL CONSTITUTION OF THE WORKING CIRCLE, AREA AND CHARACTER OF THE VEGETATION.

274. *General constitution and area.*—The Fuel and Small Timber Working Circle is 54,975 acres in extent and includes the better areas of those already set apart for fuel working under the existing working plans and schemes. The more degraded types have been exclud-ed from the working circle and formed into blocks for the supply of green leaf manure. Inaccessible areas and rocky hill tops, previously included, have now been omitted. The greater part of the working circle is situated in the plains where it extends as a marginal belt around the lower slopes of the Javadi Hills. Three of the felling series are situated on the Naikaneri plateau near Ambur in the Odagathur range. The seven Palar river plan-tations have been grouped together to form two felling series.

275. *Character of the vegetation.*—The forest is composed of an irregularly stocked low scrub of poor density, often degenerating into sparse bushes with occasional ill-shaped and stunted trees. A brief description of this type and the species which compose it has already been given in Chapter II of Part I.

SECTION 2.—METHOD OF TREATMENT.

276. *Silvicultural system.*—The system applied will be simple coppice with the reser-vation of sandal, sound minor forest produce and bark yielding trees. Coppice regrowth will be supplemented by '*rab*' † sowings as prescribed in a later paragraph.

277. *Division of the area into felling series.*—The working circle is divided into twenty-four felling series. Owing to the present lack of adequate demand and the high cost of transport from the more distant localities, only twenty of these are prescribed as 'Regular' series, while the remaining four will be treated as 'Reserve' series and will be available for working should market conditions improve and a demand arise. The area, description and situation of each series is set forth in statement below. For the benefit of the subordinate staff the description is given with reference to the several previously existing felling series.

Range.	Felling series.				
	Serial number.	Name.	Acre.	Reserve or reserves in which situated.	Description.
(1)	(2)	(3)	(4)	(5)	(6)
		(a) Regular Series.			
			ACS.		
Odagathur ..	1	Ambur	3,322	Ambur	That part of the old Naikaneri felling series north of the stream passing through Sikku jonai enclosure plus a new area to the north and west of it.
Do. ..	2	Naikaneri	3,678	Do.	That part of the old Naikaneri felling series to the south of the stream passing through Sikku jonai enclosure.
Do. ..	3	Panangatteri ..	3,088	Do.	Part of the old Panangatteri series excluding that bit south of the Panangatteri enclosure.
Do. ..	4	Pallipattu	1,758	Do.	*
Do. ..	5	Kuppampalayam ..	1,583	Ambur and Sananguppam.	*
Do. ..	6	Asanampet ..	2,898	Karuthamalai ..	The old Asanampet series plus the western slopes of the old Rasimalai series.

* With minor alterations these series remain the same as the old ones of the same name.

† Dibbing seeds in the ash of burnt heaps of debris.

Range. (1)	Felling series. Serial number. (2)	Name. (3)	Acre. (4)	Reserve or reserves in which situated. (5)	Description. (6)
		(a) Regular Series—cont.			
			ACS.		
Odagathur ..	7	Tattankinar ..	1,926	Karuthamalai ..	The old Tattankinar series plus a small portion in the west of the old Kachiguddi series plus a small new area to the south of the Melarasampet enclosure.
Vellore	8	Komiar	3,051	Arasampattu ..	The old Komiar series plus the southern portion of the old Varadalampet series.
Do.	9	Usoor	2,438	Arsampattu, Attur and Kylasagiri.	The old Usoor series plus a small part of the southern portion of the old Kylasagiri series.
Do.	10	Vellakal	1,893	Do.	The old Vellakal series plus a small part of the southern portion of the old Kylasagiri series.
Do.	11	Thellai	3,210	Arasampattu and Thellai.	*
Do.	12	Plantation, East ..	541	Kilminal plantation, Vannivedu plantation and Tiruvellam plantation.	Kilminal, Vannivedu and part of Tiruvellam plantations.
Do.	13	Plantation, West ..	568	Virinjipuram, Vikramachi and Ammundi plantations.	Virinjipuram, Vikramachi and Ammundi plantations.
Santavasal ..	14	Karungalthody ..	† 2,650	Arasampattu ..	*
Do. ..	15	Amerdi	1,012	Thellai and Malayalam.	The old Amerdi series plus a new area in the bend of the Amerdi Ar.
Do. ..	16	Santavasal	2,200	Santavasal and Malayalam.	The old Santavasal series plus the southern portion of the old Attuparai series.
Do. ..	17	Karnatigiri ..	3,730	Karnatigiri and Santavasal.	The old Karnatigiri series plus a part of the old Velamkuppam series plus a new area on either side of the Karnatigiri bridle-path south of the 1909–19 coupes plus another new area on the slopes on either side of the Tumbakadu enclosure.
Polur	18	Thaniar	3,328	Periamalai and Moolakad.	The old Thaniar series plus the western slopes of Periamalai series.
Do.	19	Pullimedu	1,240	Moolakad	*
Tiruvannamalai ..	20	Ponniar, East ..	3,910	Ponniar	The old Ponniar east series plus the rest of the reserve east of the Sattanur-Pudurnattan foot-path.
			48,024		
		(b) Reserve Series.			
Odagathur ..	1	Panangatteri ..	1,657	Ambur and Ambur fuel.	The southern portion of the old Panangatteri series plus a new area south of it.
Do. ..	2	Kallaparai	1,850	Ambur	The old Kallaparai series plus a new area north of it up the Ora Pallam Valley.
Polur	3	Jambumalai ..	1,254	Moolakad	The old Jambumalai series excluding the northern and southern ends.
Tiruvannamalai ..	4	Ponniar, West ..	2,190	Ponniar	A new area west of the Sattanur-Pudurnattam foot-path.

* With minor alterations these series remain the same as the old ones of the same name.

† 379 acres have been transferred to the Vellore range with effect from 1st September 1936, consequent to the alteration of the common boundary between the Santavasal and Vellore ranges.

The boundaries of the previously existing felling series have been shown, as well as those of the prescribed series on the fuel working maps.

278. *Rotation.*—A rotation of 40 years is prescribed, except in the two plantation felling series, in the Vellore range, where it will be 30 years (vide paragraphs 232 and 233 above).

279. *Size and allocation of coupes.*—The average size of the coupe in each of the regular felling series has been obtained by dividing the area of the series by the number of years in the rotation. As the period of this plan is ten years, coupes for only the next ten years working have been selected in the regular felling series and marked on the fuel working maps. The selection of coupes in the reserve felling series has been left to the discretion of the District Forest Officer as the position and size in each case will depend on the locality in which a demand arises, but in no case shall the size of the coupe exceed one-fortieth the area of the felling series. The areas of the four reserve series are to be found in the statement in paragraph 277 above. There should be no difficulty in making a suitable selection as the positions of old coupes, representing fellings carried out since 1900, have been shown on the fuel working maps.

280. *Calculation of the yield.*—The yield of fuel in tons per acre and of small timber in cubic feet, based on the actuals of the last twelve years working, 1923–24 to 1934–35, has been calculated for each felling series separately and is given in columns 2 and 3 of the following statement. The areas of the next ten coupes to be worked in each of the regular felling series is also given, so that the yield of each coupe can easily be determined. The quantities relating to small timber should however be treated with caution as it is likely that figures furnished by contractors in the past were not accurate.

Name of felling series.	Anticipated yield per acre.		Area of coupes—Coupe No.									
	Fuel.	Small timber.	I	II	III	IV	V	VI	VII	VIII	IX	X
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(a) Regular Series.												
	TONS.	C.FT.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.
Vellore Range—												
1 Komiar	4	1	75	81	75	78	76	75	81	75	81	78
2 Usoor	4	..	80	60	64	60	55	64	58	63	63	65
3 Vellakal	3	..	57	48	51	47	46	44	49	48	49	47
4 Thellai	5	..	66	82	83	82	75	82	84	82	89	88
5 Plantation, East ..	10	1	14	15	16	17	15	15	14	18	18	19
6 Plantation, West ..	8	..	19	19	18	17	19	17	16	17	20	20
Odagathur Range—												
1 Ambur	5	12	83	82	81	86	83	84	92	88	92	85
2 Naikaneri	5	12	96	94	97	84	97	99	92	95	86	96
3 Panangatteri ..	3	1	80	86	97	80	82	78	90	85	78	77
4 Pallipattu	7	3	61	63	44	43	41	38	42	40	48	42
5 Kuppampalayam ..	5	1	38	47	45	42	41	42	42	42	40	40
6 Asanampet ..	5	1	75	74	81	76	67	70	68	62	70	68
7 Tattankinar ..	7	..	56	62	62	57	60	48	59	59	59	59
Santavasal Range—												
1 Karungalthody * ..	5	4	69	66	61	60	64	64	62	64	61	64
2 Amerdi	8	..	27	25	22	20	26	22	25	25	22	21
3 Santavasal	8	..	51	59	62	49	52	53	50	52	55	55
4 Karnatigiri ..	7	..	92	89	88	88	88	92	85	92	88	96
Polur Range—												
1 Thaniyar	7	5	79	80	84	84	84	81	72	76	76	86
2 Pullimedu	6	4	32	31	34	36	31	33	29	31	34	34
Tiruvannamalai Range—												
Ponniar, East ..	5	..	104	96	104	100	100	100	101	101	100	104
(b) Reserve Series.												
Odagathur Range—												
1 Panangatteri ..	3	1	Coupes not allocated. The area is a new one and the averages are based on the yields for the adjoining Panangatteri regular felling series.									
2 Kallaparai	4	6	Coupes not allocated.									
Polur Range—												
Jambumalai ..	7	3	Do.									
Tiruvannamali Range—												
Ponniar, West ..	5	..	Coupes not allocated. The area is a new one and the averages are based on the yields for the adjoining Ponniar East regular felling series.									

* See foot-note to statement in paragraph 277 marked thus †.

SECTION 3.—METHOD OF EXECUTING THE FELLINGS.

281. *Regulation of operations.*—One coupe in each of the regular felling series and one in each of the reserve felling series should there be a demand, will be put up for sale each year. The fuel working maps indicate the sequence in which the coupes in the regular felling series are to be worked. Definite coupes have not been allotted to definite years of working. Thus, where there is no demand and a coupe is not sold, confusion owing to arrears will not arise and no deviation from the working plan is involved. The fact with reasons for not working should however be recorded in the control form.

282. *Laying out and demarcation of coupes.*—The coupes to be sold in the regular felling series will be surveyed and demarcated in the forest by means of cut lines 6 feet wide by the end of November of the year preceding that of felling. Where a boundary corresponds to a reserve line, stream, road or other well defined feature, clearing is not necessary. The boundaries of each felling series and the area to be worked during the next ten years have been fixed after inspection in the forest, while the subdivision into coupes has been largely made from the maps, as to go over all the lines would involve an unnecessary waste of time. If, when laying out a coupe it is found that any stream, foot-path, etc., which has been adopted as a boundary, does not actually exist or is in a different position to that shown on the map owing to inaccuracies in survey, a straight line must be cut to join the points in question, the main considerations being—

(i) to adhere to the prescribed area as far as possible.

(ii) to keep the cost of demarcation down to the minimum.

No difficulty need be anticipated in laying out coupes, but a word of caution seems desirable, as an inexperienced ranger may rigidly adhere to the map boundaries and lay out a coupe of incorrect area. Minor differences between prescribed and surveyed areas should not be regarded as deviations requiring sanction.

283. *Cost of demarcation.*—It has been customary in the past to hand over all fuel resulting from the clearing of coupe lines to the contractors who purchase the respective coupes and, at the same time, to recover from them the cost of clearing. A condition to this effect is embodied in the sale notice each year. The practice has worked satisfactorily in the past and should continue.

284. *Agency of felling.*—Felling will invariably be carried out through the agency of contractors. In localities where there is a demand for green leaves for manure, coupes will be sold in public auction every year three months in advance of the year of felling and the contractors permitted to cut and supply manure leaf therefrom.

285. *Period of lease.*—Leases will begin on the 1st of January each year and will be current for three months, from this date, for the removal of green leaf, and for 11 and 12 months respectively, from the 1st of April, for felling and removals. Terminating felling one month ahead of removals affords an opportunity of getting defects remedied by contractors before their security deposits are returned and also eliminates, to a large extent, the necessity for departmental rectification and the consequent adjustment of petty items of expenditure. In the case of coupes left unsold in the general sale but sold subsequently, it will also be arranged that the lease terminates on the last day of February with reference to felling and on the 31st of March for removals. In cases in which the coupe is sold three months in advance the agreements may provide for a suitable delay in initial payment.

286. *Area remaining unfelled on the termination of a lease.*—If any portion of a coupe remains unfelled on the 31st March it will be surveyed and the area computed, unless it contains poor growth and is not worth considering. (It must be remembered that the fuel forest is so variable in quality that blanks or patches of poor growth, sometimes many acres in extent, occur in places. Large areas not fit to be worked have generally been excluded from the working circle, but it is not practicable to mark in on the maps and exclude every blank or patch of poor growth). The District Forest Officer will give the contractor to whom the adjoining coupe has been sold, and to him only, the option of working the unfelled portion at a reasonable rate. Should the contractor refuse it, the area will be left unfelled.

287. *Division of coupes into strips and control of fellings.*—Immediately a coupe is sold it will be divided into a convenient number of strips either by natural features or cleared lines 6 feet wide, so that the area of each strip is from 20 to 25 acres. In coupes situated on slopes the strip lines should invariably run across the contours, that is more or less at right angles to them. The work will be done by the contractor who has purchased the coupe and he will not be permitted to begin felling until the strip lines, as pointed out by the Range Officer or local forester, have been cleared. It has been customary in the past to clear strip lines ahead of sales, but this practice is open to objection in that the expenditure incurred is not recoverable in cases where coupes remain unsold. The alternative procedure detailed above is therefore prescribed. The fuel obtained in clearing the lines is, of course, the property of the contractor. The coupes will be felled strip by strip. Work in each strip must be completed and passed as satisfactory by the Range Officer before work may begin in the next strip. But in the coupes sold in advance for manure leaf cutting prior to fuel working strip restrictions will not apply to manure leaf working which will be permitted throughout the coupe.

288. *Green leaf manure.*—In accordance with G.O, Ms. No. 1573, Development, dated 14th July 1937, provision has been made in paragraphs 284 and 285 above to sell fuel coupes three months in advance of the year of felling, so that contractors may cut and supply manure leaf therefrom.

289. *Cutting thorny growth at the time of felling.*—It is more convenient to deal with this subject separately rather than in the felling rules which follow. The subject was discussed at the Conservators' Conference on 25th June 1935 and the following prescription was framed for use in coupe agreements :—

> "The contractor shall commence to work on each coupe or strip at one corner thereof and shall proceed with the work evenly removing everything that he is required to remove from the coupe or strip at the same time and cutting down (save as herein provided) all trees, shrubs and bushes whether large or small level with the ground, as shown in the schedule attached, leaving the bark intact and adhering to the wood all round, and without breaking or disturbing the surface of the ground."

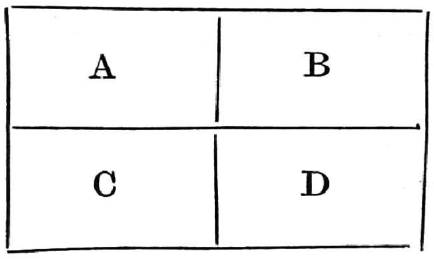
This leaves it open to the Working Plans Officer or to the executive to decide on the details the particular conditions of a locality require.

290. In many parts of the working circle the forest is composed largely of thorny growth. Natural regeneration of fuel species is almost entirely absent. Thus, the question of uncut growth suppressing natural regeneration or coppice regrowth need not be considered. Artificial regeneration can only be done over a part of area so that cutting thorny growth throughout would unnecessarily expose the soil in many places at a time of the year when cover is most needed. Silviculturally, therefore, no useful object is achieved by insisting on the contractor cutting more than he wishes to cut as being saleable. Debris required for fencing and *rab* heaps is dealt with in a later paragraph.

291. Another point to be considered is that cutting thorny growth costs the contractor from As. 8 to Re. 1 per acre and the amount of cutting insisted on is taken into consideration by him when he bids at the auction sales, the bid amount being reduced in proportion to the amount of cutting to be done.

292. Cut thorns reproduce prolifically by numerous coppice shoots, unless they are killed by some method which is not yet possible at a reasonable cost. A small experiment was carried out by the writer, under the orders of the Conservator of Forests, Working Plans Circle, to study the extent to which cut thorns do reproduce. The following is a brief account of the experiment and its result.

293. A plot of 2 chains square was selected in average type forest in a coupe where felling was about to commence. First everything which a contractor would normally cut for fuel was cut and removed. The plot was then divided into four sub-plots as shown in the figure in the margin. Ten thorny bushes were selected in each sub-plot and all forty bushes numbered serially and the number of shoots in each bush counted and recorded. The remaining growth in sub-plots A and D, including the twenty numbered bushes, was then cut flush with the ground, while sub-plots B and C were retained as controls. Shoots were counted in the forty marked bushes from time to time and recorded in the following statement.



Bush number.	Species.	Number of shoots before cutting (15th April 1935).	Number of shoots after cutting.									
			7th May 1935.	4th June 1935.	18th June 1935.	15th July 1935.	14th August 1935.	13th September 1935.	14th October 1935.	29th November 1935.	22nd January 1936.	4th March 1936.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
			Cut Bushes.									
1	*Indigofera paucifolia.*	10	..	17	*	*	*	*	*	*	*	*
2	Do.	13	..	101	*	*	*	*	*	*	*	*
5	Do.	2	..	31	*	*	*	*	*	20	20	20
21	Do.	3	..	6	22	22	13	13	12	11	9	9
22	Do.	2	..	10	18	14	14	12	12	11	7	8
28	Do.	4	..	16	*	*	*	*	*	20	20	20
29	Do.	2	..	7	*	*	*	*	*	27	21	21
30	Do.	1	..	12	*	*	*	*	*	*	20	20
3	*Zizyphus œnoplia* ..	1	..	3	9	8	7	*	*	10	8	5
6	Do. ..	2	..	5	7	7	8	*	*	3	3	2
7	Do. ..	3	..	1	4	10	10	*	*	5	5	4
23	*Zizyphus jujuba* ..	3	..	8	12	13	14	14	14	9	9	9
4	*Carissa carandas* ..	7	..	..	18	33	*	*	*	14	12	12
10	Do. ..	3	..	8	30	31	*	*	*	*	26	25
8	*Randia dumetorum* ..	3	..	..	6	13	15	*	*	26	25	25
9	Do. ..	1	..	..	5	5	9	17	17	15	16	16
24	Do. ..	2	..	..	3	6	24	*	*	22	22	22
25	Do. ..	1	..	..	2	6	6	13	13	8	6	6
26	Do. ..	3	..	..	..	..	..	15	15	13	11	9
27	*Gymnosporia montana*	8	..	..	..	..	..	12	11	13	12	12
			Uncut Bushes.									
11	*Indigofera paucifolia.*	4						7	7	7		
12	Do.	6						9	9	9		
13	Do.	5						8	8	8		
18	Do.	4						3	3	3		
31	Do.	7						8	8	8		
33	Do.	8						9	9	9		
36	Do.	9						11	11	11		
40	Do.	5						5	5	5		
19	*Zizyphus œnopolia* ..	2						4	4	4		
20	Do. ..	4	No increase or decrease.					4	4	4	No increase or decrease.	
16	*Zizyphus jujuba* ..	1						1	1	1		
14	*Carissa carandas* ..	7						7	7	7		
15	Do. ..	2						2	2	2		
17	Do. ..	2						2	2	2		
32	*Randia dumetorum* ..	2						2	2	2		
35	Do. ..	2						2	2	2		
37	Do. ..	1						1	1	1		
39	Do. ..	2						2	2	2		
34	*Toddalia aculeata* ..	7						7	7	7		
38	Do. ..	1						1	1	1		

* Innumerable.

294. The chief objections to cutting are thus—

(i) Exposure of the soil in places where no other growth exists at a time of the year when protection is most needed,

(ii) lower bids at the auction sales, and

(iii) stimulation of undesirable growth.

Against these must be considered the two reasons why cutting is necessary.

295. Firstly, the contractor has to erect a thorn fence all round the coupe and for this a considerable amount of cutting is required, generally along the outer margins of the coupe. Secondly, debris must be provided for rab heaps ; and if a contractor is permitted to cut only sufficient thorns for the fence, the only debris available for rab heaps would be the small branches and twigs of fuel trees which have been felled, and they would not suffice.

296. This discussion leads to the conclusion that only such cutting shall be done as is necessary to provide a hedge of the specified dimensions—vide paragraph 324 below, and a sufficient quantity of debris for the required number of rab heaps. A prescription on these lines has therefore been inserted in the Felling Rules ; but since it has been prescribed under Subsidiary Silvicultural Regulations that as much *rab* regeneration will be undertaken as is permitted by the amount of debris available, subject to a maximum of 15 per cent of the area, it may be necessary in some cases to cut thorny growth over the entire coupe. If, after a few years working, this is found to be so in the majority of cases the prescription should be altered to one of complete cutting.

297. *Useless tree species.*—Here again the question of soil cover is the chief consideration. In the absence of natural regeneration there is no point in felling useless tree species such as *Dalbergia paniculata* and *Gyrocarpus jacquini,* unless they occur on or near a *rab* line or are interfering with coppice of fuel species.

298. *Felling rules.*—(i) With the following exceptions all trees shall be felled level with the ground, leaving the bark intact adhering to the wood all round and without breaking or disturbing the surface of the ground :—

Exceptions.—Sandal, sound tamarind, wood-apple and other minor forest produce yielding trees. Bark yielding species, viz., *Cassia auriculata* and *fistula.*

The trees not to be felled will be marked by Range Officers before the sale and a list prepared and, if required, produced at the sale for the information of bidders.

(ii) Stools need not be coppiced.

(iii) Useless species need not be felled unless they occur in or near a *rab* line, when they shall be removed.

(iv) Sufficient thorny growth shall be cut to provide for a fence of the specified dimensions and for the required number of *rab* heaps.

(v) All fellings in the coupe shall be done only by the coolies of the contractor and the contractor, or his authorized agent, shall be present during the fellings.

299. *Disposal of felled material.*—(i) *Small timber.*—All small timber shall be hammer-marked by the coupe forest guard before it is removed.

(ii) *Firewood.*—All felled firewood, down to whatever size the contractor chooses to remove, shall be billetted and stacked prior to removal. The size of the stacks will be fixed by the District Forest Officer in consultation with the contractors. If possible a uniform size should be adopted throughout the division.

(iii) *Twigs and thorns.*—The cutting and removal of twigs and thorns by purchasers and consumers, under headload chits issued by the contractor, shall not be permitted as, obviously, the contractor, or his agent, will sell chits in the town, or on the roadside, even though he may be bound by agreement to sell them in the coupe. Purchasers then, armed with a chit to safeguard them, collect their headloads by pilfering from the nearest point of the reserve.

SECTION 4.—TABULAR STATEMENT OF FELLINGS.

300. As definite coupes have not been allotted to definite years of working no tabular statement of fellings is necessary. The areas of the next ten years' coupes in each felling series has been furnished in the statement at paragraph 280 above.

SECTION 5.—SUBSIDIARY SILVICULTURAL REGULATIONS.

301. *Artificial regeneration.*—The almost complete absence of natural regeneration and the impaired vigour of the coppice regrowth, due to overworking in the past, render artificial regeneration necessary. *Rab* sowings (dibbling seeds in the ash of burnt heaps of debris) in strips are therefore prescribed. The following notes on regeneration methods are for guidance : they are not prescriptions and may be varied with the approval of the Conservator.

302. *Heaping debris.*—Wherever possible this should be done by coupe contractors and may be included as a separate clause in their agreements. Debris will be heaped in patches 9 feet wide and not less than 50 feet, or more than 100 feet in length. On sloping ground they will run along the contours. The patches will be located in places where there is no natural regeneration or coppice regrowth, and where artificial regeneration is likely to succeed. Blanks which are almost certain to prove a failure should be avoided. The patches will as far as possible be distributed evenly throughout the area, their number and size being the maximum which can be done with the amount of debris available after the erection of a thorn fence around the coupe. (Vide paragraph 324.)

303. *Height of the heaps.*—The beneficial effect of a burn consists chiefly of—

(i) Sterilization of the soil by killing the seeds and roots of grass and other weeds.

(ii) The manurial value of the ash. It is also probable that the soil undergoes some physical change which is conducive to the better growth of tree species. Experience shows that quite a small quantity of ash is sufficient to give the full manurial effect, while an accumulation of it retards the development and growth of young seedlings. Thus, a burn should be sufficiently intense to assure the sterilization of the soil and the prevention of weed growth without the production of an excessive quantity of ash.

304. In average conditions it has been found that the most suitable height is 3 feet, provided the heap has been well compacted. The burn from a heap of this height does not produce excessive ash and will keep out grass and weeds for about eighteen months, while poorer burns allow grass and weeds within twelve months so that a weeding in the first

year becomes necessary. Heaps will therefore be 3 feet in height after being thoroughly beaten down with heavy sticks. This compacting is a very important point; if not done an intense burn will not be obtained. If it is found that this height does not give a burn of the required intensity it should be increased to 4 or even 5 feet.

305. *Burning.*—As short a period as possible should lapse between the burning and the sowings as the ash is liable to be blown away by wind or washed away by rain.

306. *Soil preparation and sowing.*—Sowing in the patches will be done as indicated in the following diagram :—

50 to 100 feet long.

2 feet

.. .. dibbling line .. ..

$2\frac{1}{2}$ feet

.. .. ,, ,, ...

$2\frac{1}{2}$ feet

.. .. ,, ,, ...

2 feet

The soil should be worked to a width of 12 inches and a depth of 6 inches along the three dibbling lines. Seed will be dibbled lightly along the lines and covered with about $\frac{1}{2}$ inch of soil.

307. *Choice of species.*—A mixture of two or three species will be dibbled in each patch. The mixture should not be the same in all the patches, but should be varied as much as possible. The selection of the species must naturally depend on the quantity and kind of seed available each year and it is left to the District Forest Officer to select from the species available those which he considers will grow best in each locality. The following is a list of species which may be tried :—

Acacia leucophloea	*Cassia siamea.*
,, *sundra.*	,, *fistula.*
Albizzia amara.	*Hardwickia binata.*
,, *lebbek.*	*Pithecolobium dulce.*
Azadirachta indica.	*Pterocarpus marsupium.*
	Tamarind.
Red sanders	(On well drained slopes in the plantation felling series).
Terminalia arjuna.	(In low lying parts of the plantation felling series).

308. *The collection of seed* and their storage until required are most important. The District Forest Officer should carefully watch the progress of collection and seeds should be collected by subordinates whenever possible, or under their personal supervision.

309. *Date of sowing.*—*Rab* sowings were first tried in 1931–32 and only a limited area was sown each year. Sowings were done in July and September. Experience over this limited period would seem to indicate that the July sowings were generally ineffective, while those done in September produced good germination but the subsequent development of the seedlings was poor. Advantage was not taken of the thunder showers which usually occur from towards the end of April to about the middle of June.

310. Coupe agreements are usually executed by the 1st of April. In most cases half the number of strips can be burnt and sown by the middle of September, before the beginning of the North-East monsoon. The remaining strips can be completed by March and burnt and sown towards the end of April, before the thunder showers occur. If the South-West rains from June to August are satisfactory, seedlings resulting from the April sowings should become fully established in the following North-East monsoon; but should the South-West rains prove a failure, the April patches will have to be resown in the following September. This will of course necessitate the collection of a larger quantity of seed but it is believed that it is worth taking the risk involved in the April sowings.

311. It is therefore suggested that a first sowing, limited to half the area of each coupe, be done by the middle of September in the year of felling and that the rest of the coupe be sown during the last week of April following the year of felling. By year of felling is meant 1st April to 31st March. Should the April sowings prove a failure, due to deficient rainfall a resowing of the area in question will have to be done in the following September along with the first sowings of the next years coupes.

312. *Weeding and tending.*—If the burn has been a good one scarcely any weeding should be necessary in the first year. Grass and weeds encroaching on the line of *rab* patches will be *uprooted* by beat subordinates. Mere cutting will not suffice as it is most important that the plants should be kept free from weed competition, for moisture in the soil, during the hot weather.

313. *Soil aeration.*—A soil aeration round the plants in September and again in February is likely to conserve moisture and help them through.

SECTION 6.—OTHER REGULATIONS.

314. *Supply of small timber to ryots for the manufacture of agriculture implements.*—The contractor shall be required to supply, on demand by the ryots, small timber for the manufacture of agricultural implements in as far as it is available in his coupe. A clause to this effect should be inserted in his agreement.

315. *Disposal of palmyra palms in the two plantation felling series.*—A detailed inspection of the palmyra palms in the Tiruvallam plantation, of the Plantation East felling series, was made by the Inspector of Excise at the request of the writer, who was present during the inspection. The Inspector was of the opinion that the palms were poor specimens and not likely to be of much use for tapping. Further, statistics show that of the total number of coconut, date and palmyra palms leased annually for tapping in this district, the palmyra contributes only 10 per cent. This is not due to scarcity, but to the fact that the palmyra yields an inferior quality toddy. Roadsides and easily accessible arable lands throughout the district are plentifully stocked with it, but it is not generally tapped.

316. There is a fair demand in the vicinity of towns and large villages for palmyra rafters ; but, unfortunately, the palmyra growing in the Palar river plantations is useless for this purpose for, growing on dry sandy soil, the hard fibrous peripheral tissues of the stem do not extend inwards to a depth sufficient to render conversion into rafters possible.

317. As a minor forest produce yielding species, the palmyra grown on dry sandy soil is unimportant, little or none of its fruit being collected as the fruit generally matures, dies and falls off before the production of any appreciable quantity of edible pulp has taken place.

318. There is therefore no alternative to including the species as a part of the fuel crop and permitting the contractor to fell or leave it as he pleases. If a separate demand does arise, which is improbable, the District Forest Officer shall decide if it is worth considering. Further propagation of the species shall not be undertaken.

319. *Indicator areas.*—The felling of indicator areas is not prescribed. The anticipated yields per acre from the various felling series, furnished in columns 2 and 3 of the statement in paragraph 280, are based on the actual outturns of twelve years working, and obviously these anticipated yields are likely to be more accurate than any estimate framed by felling a plot or strip one acre in extent in forest the constitution of which varies from acre to acre.

320. *Closure to grazing.*—Felled coupes will be closed to grazing for seven years including the year of felling, but grass cutting, in particular areas, may be permitted with the specific sanction of the Conservator.

321. *Thorn fence round closed areas.*—The Fuel Working Circle occurs as a belt around the lower slopes of the Javadi hills. On the lower side it is surrounded by cultivation interspersed with numerous villages, while the slopes above it, although beyond the limit of economic fuel working, are also grazed by village cattle. Herds of cattle are to be found in every village and the graziers who accompany them to the forest are usually boys or adults of poor mentality. The fact that *rab* operations are being carried out in an area would not, in itself, convey much to the mind of the average grazier unless the particular area was protected by a more or less stout fence. Further, the grazier generally rests all day under a tree and his cattle stray anywhere, perhaps into some *rabs* through a weak spot in the fence around an adjoining closed area.

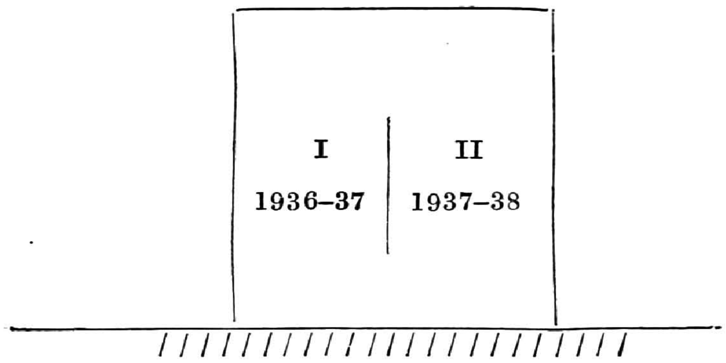
322. Cases of grazing in closed areas are sometimes reported, but many pass undetected. The general attitude of the ryots towards the forest department, though not openly hostile, is by no means friendly and the forest guard, desiring to lead a peaceful life and at the same time endeavouring to justify his appointment, reports an occasional case.

323. This somewhat lengthy discussion, would, perhaps, appear to be superfluous ; but it is inserted in support of the prescription which follows and which may seem to be unnecessary in view of the fact that in some districts, where the value of the thorn fence round a closed area is more moral than material, too much debris is used in constructing the fence.

324. It is therefore prescribed that as each coupe is felled it will be fenced on all sides, with cut thorns, except in the case of the Palar river plantations where only the outside boundary needs a fence. The minimum dimensions of the fence should be 4 feet × 4 feet. As conditions are much the same everywhere these dimensions should be adhered to throughout the working circle. The work will be done by coupe contractors and may be included as a separate clause in their agreements.

325 Rights of way and other specially made paths passing through closed areas to legitimate grazing grounds or watering places will be fenced in similarly on either side by the department, provided there are no suitable alternative paths.

326. *Coupe stones.*—As soon as possible after the completion of felling in a coupe, four stone slabs three to four inches in thickness and of the usual size will be planted, one at each corner. If a coupe has more than four sides it is sufficient if stones are planted at the four salient corners. The number of the coupe and the year of felling will be engraved on each stone. On a common boundary between two coupes a double stone, as illustrated below, will be planted.



CHAPTER IV.—WORKING PLAN FOR THE BAMBOO WORKING CIRCLE.

SECTION 1.—GENERAL CONSTITUTION OF THE WORKING CIRCLE, AREA AND CHARACTER OF THE VEGETATION.

327. *General constitution and area.*—The Bamboo Working Circle is 189,770 acres in extent and includes all areas in the division where bamboos are found in workable quantities. As bamboos are extracted from steep slopes and carried to forest depots in head-loads the question of excluding any areas from the working circle on the ground of inaccessibility need not be considered. The more easily accessible areas have, however, been overworked, while those further away from forest roads or cart-tracks have not been fully exploited. The question of facilitating exploitation in the latter is dealt with in paragraphs 346 and 347 below.

328. The working circle is distributed in the various ranges as follows :—

	ACS.
Odagathur range	52,416
Vellore range	28,345
Santavasal range	50,643 *
Polur range	46,881
Tiruvannamalai range	11,485
Total ..	**189,770**

329. *Character of the vegetation.*—A brief description of the bamboo forest has been given in paragraphs 45 to 48 above. Special mention must be made of the bamboo-sandal mixture found on the Javadi plateau. It is in this type that the largest sandal trees in the division are to be found and there is no doubt that many of them date back beyond the life of the bamboo crop and that when the present clumps were mere bushes the sandal was already very tall. The bamboo while serving as an admirable host to sandal is also, when it flowers and dies, a grave danger in the fire season, necessitating special measures for protection.

330. *Flowering and dying of bamboo.*—Dates of flowering in the past have been recorded in paragraph 49 above. The present flowering which began in about June 1933 is progressing much more slowly than was at first anticipated. Flowering of *Dendrocalamus strictus* is confined to isolated clumps and occasional small patches up to about 5 acres in extent. *Bambusa arundinacea* is flowering on a gregarious scale, the two most active centres being along the Nadanur-Mandaparai footpath and on either side of the Patrakad-Polur road, between Patrakad and the Parappumadai saddle. Areas which had flowered up to the 1st of April 1934 have been marked on the bamboo working maps.

* 4,327 acres, comprising the Komiar felling series, have been transferred to the Vellore range with effect from 1st September 1936, consequent to the alteration of the common boundary between the Santavasal and Vellore ranges.

331. *Damage to Dendrocalamus strictus.*—Very extensive damage has been done to *Dendrocalamus strictus* by graziers, who lop it for cattle fodder. The damage is met with practically throughout the working circle and is particularly striking around enclosures. Clumps are hacked at a height of 8 to 10 feet from the ground and where repeated hacking has taken place the clumps are dead or very nearly so. Prescriptions dealing with this most deplorable state of affairs are given in section 5 below.

SECTION 2.—METHOD OF TREATMENT.

332. *General.*—Bamboo fellings are made over vast areas every year. Under existing conditions departmental working is out of the question, except perhaps as a temporary measure to break a ring. Even then it would be adopted with reluctance. As long as exploitation is carried out through the agency of contractors, it is extremely difficult for the staff to enforce precise and elaborate prescriptions, however desirable they may be silviculturally. It is therefore essential that felling rules should be such that they are easily understood by the cutting cooly and their infringement readily apparent to inspecting officers. The most important points to be considered in framing felling rules are

(i) The felling cycle.
(ii) The intensity of fellings in the clump.
(iii) The height at which culms should be cut.

333. Before proceeding to discuss these points, it should be mentioned that the proportion of the demand to the quantity available is far smaller in the case of *Bambusa arundinacea* than it is in the case of *Dendrocalamus strictus.* Further, *Bambusa arundinacea* is not lopped for cattle fodder, reproduces itself much more prolifically than *Dendrocalamus strictus* does and withstands unrestricted and irregular cutting. In fact, except after flowering and seeding, it is unusual to see a completely dead *Bambusa arundinacea* clump. There is thus no likelihood of *Bambusa arundinacea* being overworked to an extent sufficient to cause any appreciable deterioration of the crop as a whole. The discussion which follows, and the rules framed therefrom, are with reference to *Dendrocalamus strictus* but as both kinds of bamboo occur as a mixed crop, often extensively, and as two separate sets of felling rules are unnecessary, the rules which have been framed may be taken as applicable to both *Dendrocalamus strictus* and *Bambusa arundincea.*

334. A series of experiments with *Dendrocalamus strictus* carried out in accordance with the prescriptions of Mr. K. R. Venkataramana Ayyar's Working Plan (1920) for the then South Vellore division (Chief Conservator's Proceedings No. 3, dated 22nd January 1920), yielded the results noted in the statement below. Observations were made over a period of eight years.

A. General observations.

Method of treatment.	Experiment number.	Felling cycle.	Average number of culms produced every year.	Total number of culms produced during the cycle.	Number of new culms available for felling	Average annual yield per clump in culms.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Hundred per cent felling of culms over one year old.	1	Two years ..	2	4	2	1	Harmful effect on clumps; many died after ten years. Culms of poor quality.
	2	Three years ..	2	6	4	1·3	Culms better than experiment 1 and clumps healthier.
	3	Four years ..	1·5	6	4·5	1·1	Clumps died early.
Fifty per cent thinning of culms over one year old on one side of clump.	4	Two years ..	2	4	2/2 = 1	·5	Culms long-lived and healthy. Clumps not much damaged.
	5	Three years ..	4	12	8/2 = 4	1·3	Clumps healthy.
	6	Four years ..	3	12	9/2 = 4·5	1·1	Do.
Fifty per cent thinning of culms over one year old evenly over the whole clump.	7	Two years ..	4	8	4/2 = 2	·1	Clumps not healthy.
	8	Three years ..	4	12	8/2 = 4	1·3	Clumps healthy.
	9	Four years ..	5	20	15/2 = 7·5	1·9	Do.

B. Longevity of culms.

Cycle.	Life of culms. Maximum.	Minimum.
(1)	(2)	(3)
Two years	Twelve years	Four years.
Three years	Less than twelve years	Do.
Four years	Do.	Less than four years.

The following conclusions are drawn from the results recorded.

335. *Felling cycle.*—It is seen that a two-year felling cycle is undesirable. The three-year cycle appears to give consistently high yields under all the methods of treatment and it is interesting to note that in all cases the same outturn has been obtained under this cycle. Under the method of felling half the number of old culms, that is culms more than a year old, and leaving the remainder evenly distributed in the clump, the maximum outturn appears to be realized on a four-year cycle, but against this, the longevity of the

culms shows that the minimum life of a culm on the four-year cycle is less than four years, so that a proportion of the culms must be expected to be dead before they are felled. With a three-year cycle this would not be the case. It thus seems that, all things considered, a three-year cycle is the most suitable. A three-year felling cycle is therefore prescribed.

336. *The intensity of fellings in a clump.*—The removal of all culms from a clump, except those of the current year, resulted generally in the deterioration and early death of the clump. Under the methods of felling half the number of old culms on a three-year cycle the total number of culms produced during the cycle is twelve in both cases. Of this number four culms are of the current year, so that the number available for removal is four, while the remaining four are to be left in the clump. The retention of some old culms is necessary not only for maintaining the rhizomes in full vigour but also for the mechanical support of the new culms. If it is prescribed that half the number of old culms should be left in the clump, check by inspecting officers will be difficult. It is therefore better to prescribe that a definite minimum number of culms, say four, shall be left in each clump.

337. *The height at which culms should be felled.*—This question is not considered in the experiments. It is one on which there is considerable difference of opinion. There is no truth in the belief that felled culms die back at the rate of one internode a year, but it is perhaps probable that felling a few feet from the ground preserves the rhizomes below for a longer period than low felling does. In practice the most convenient height is from two to three feet from the ground and, silviculturally, there seems to be no objection to this.

338. *Felling rules.*—In the light of what has been said above, the following felling rules are prescribed :—

(i) No current years culms shall be felled. When young culms are absolutely necessary for basket making or similar purposes, the District Forest Officer will confine removals to definite areas, the location and size of which will depend on the nature of the demand. Such areas should be as limited as possible.

(ii) A minimum of four mature culms, that is culms over a year old, shall be left in each clump.

(iii) Felling shall be done at a height of from two or three feet from the ground.

339. *Calculation of the yield.*—No forecast of the yield can be made as control journals, in which past yields are recorded, do not show in all cases whether the quantities removed by contractors are cart-loads, head-loads or culms. Apart from this, any estimate, however carefully prepared, would not be of much value as the bamboos have begun to flower and die.

SECTION 3.—METHOD OF EXECUTING THE FELLINGS.

340. *Subdivision of the area.*—The existing felling series and coupes will be retained in view of the fact that in drawing up the working plans in which they were prescribed (vide paragraphs 170 and 171 above) very careful consideration was given to the Malayalee labour supply, the use of collection depots and extraction paths. The details relating to each felling series are set forth in the statement below. The District Forest Officer may change the collection depots and extraction paths for any coupe from time to time if circumstances require it.

Name of felling series.	Coupe.		Names of collection depots to which the produce should be transported.	Extraction paths allowed.
	Number.	Area, acres.		
(1)	(2)	(3)	(4)	(5)
			Odagathur Range.	
Vellakal	I	2,490	Malamaduru	All footpaths running through the coupe which ultimately lead to the collection depot or depots and thence to the plains along the Ambur-Asanampet road.
	II	3,315	Pudur and Sengilikuppam.	
	III	3,085	Bangiarkadai	
Panangatteri ..	I	2,112	Isappa-Naikaneri Donimadugukadai.	Do.
	II	1,734	Donimadugukadai ..	
	III	1,338	Thalakalmalai	
Asanampet ..	I	3,597	Gulimalaikadai .. .. Orapallam	Do.
	II	2,611	Manjakuttai .. .. Kallaparai tank	
	III	2,528	Durgam ... . Bangiarkadai	

Name of felling series. (1)	Coupe. Number. (2)	Coupe. Area, acres. (3)	Names of collection depots to which the produce should be transported. (4)	Extraction pat allowed. (5)
			Odagathur Rauge—cont.	
Naikaneri ..	I	2,912	Naickaneri..	All footpaths running through the coupe which ultimately lead to the collection depot or depots and thence to the plains along the Ambur-Asanampet road.
	II	4,288	Malayappa .. .. Naikaneri .. .. .. Vengili	
	III	6,374	Banghi Einar	
Karuthamalai ..	I	4,391	Thirtham .. .. .. Melarasampet	Do.
	II	6,694	Melarasampet .. .. Kolandai .. .. .. Goundan kottoy	
	III	4,947	Manjakuttai .. .. Masimaduvu	
			Vellore Range.	
Kottur	I	3,999	Thandavaroyenkottai .. Thurinjikadu	All foot paths running through the coupe which ultimately lead to the collection depot or depots.
	II	3,322	Vairavankoil .. .. Jambukadai	
	III	1,639	Kalathumedukadai ..	
Attiyur	I	1,527	Kadukaijonai	All foot paths running through the coupe which ultimately lead to the collection depot.
	II	4,256	Vannankolai	
	III	2,574	Magadam	
Thellai	I	4,836	Veppalanthangal .. .. Pilamarathukadai ..	All paths running through the coupe which ultimately lead to the collection depot or depots and thence along the Thellai-Kinnikulam road.
	II	4,016	Pilamarathukadai .. Kosuguddai	
	III	2,176	Kosuguddai .. .. Pilamarathukadai .. Poosagundanvalasai ..	
			Santavasal Range.	
Thongamalai ..	I	1,719	Komiarkadai .. .. Yeraliarkadai	All footpaths running through the coupe which ultimately lead to the depot or depots.
	II	1,197	Yeraliarkadai	
	III	1,817	Perianthamalaikadai in Komiar coupe III.	The footpath leading to the depot via Katheapet.
Nayakkanur ..	I	1,954	Komiarkadai .. .. Yeraliarkadai	All footpaths running through the coupes which ultimately lead from the plateau to the collection depot or depots.
	II	1,599	Perianthamalaikadai in Komiar coupe III.	
	III	947	Kannupuliamarathukadai.	
Kudikam ..	I	1,101	Kudikam .. .. .. Kannupuliamaram ..	Banghi road.
	II	1,434	Kudikam	
	III	998	Kannupuliamaram ..	
Komiar * ..	I	1,203	Komiarkadai	All foot paths running through the coupes which ultimately lead to the collection depots.
	II	1,434	Periyanthumalaikadai ..	
	III	1,690	Kannupuliyamarattukadai.	
Nekkini	I	1,749	Veppalanthangal	The Palamet-Veppalanthangal footpath along the Godar.
	II	1,424	Amerdi	Thongimarathur-Amerdi and Kolayam Kiranur-Amerdi foot paths.
	III	1,024		
Sathampattu ..	I	1,642	Sathampattu	Latham road.
	II	691		
	III	1,159	Sathampattu .. .. Pallattur	Pallattur-Sathampattu cart-track and thence along the Latham road.

* *Note.*—Trnsferred to the Vellore range with effict from 1st September 1936 consequent to the alteration n the common boundary between the Santavasal and Vellore ranges.

Name of felling series.	Coupe. Number.	Area, acres.	Names of collection depots to which the produce should be transported.	Extraction paths allowed.
(1)	(2)	(3)	(4)	(5)
			Santavasal Range—cont.	
Kanamalai ..	I	493	Amerdi .. .. .. Valiyur	The Kanamalai-Amerdi footpath via Pichikanavi.
	II	531	Palaparamput .. .. Valiyur	The footpaths leading west to Palaparamput and east to Valiyur.
	III	877	Palaparamput .. .. Attuparai	The footpath leading west to Palaparamput and east to Attuparai.
Nadanur ..	I	1,728	Seranakuppam	Latham road.
	II	1,828	Nadanur	
	III	1,229		
Puliankuppam ..	I	1,905	Kannkoil .. .. .. Silliammankoil	All the footpaths running through the coupe which ultimately lead to the collection deposts and thence along the cart-track to Santavasal.
	II	1,449		
	III	790		
Bonganur ..	I	1,332	Silliammankoil	The footpaths leading to the depot via Pasimoduvu.
	II	1,473	Naduthumbakadu ..	The Patrakad-Chillimalai road.
	III	1,404		
Shembakatope ..	I	1,645	Shembakatope	All footpaths running through the coupe and ultimately leading to the collection depot and thence along — Coupes I and III, the cart-track to Santavasal. Coupe II, the Thumbakadu-Thaniar cart track.
	II	2,086	Naduthumakadu	
	III	2,029	Silliammankoil	
Santavasal ..	I	2400	Koraiarkadi	All footpaths running through the coupe and thence along— Coupe I, the Shembakatope-Santavasal road. Coupe II, the Thumbakadu-Patrakad-Polur and Shembakatope-Santavasal roads. Coupe III, the Thumbakadu-Athuvambady path and the Kilur cart-track.
	II	1,363	Naduthumbakadu .. Shembakatope	
	III	1,299	Periyerkadai in Athuvambady.	
			Polur Range.	
Pudupattu ..	I	1,830	Burgur	All footpaths running through the coupe which ultimately lead to the collection depot and thence along Banghi road.
	II	1,562		
	III	1,939		
Veerappanur ..	I	2,042	Burgur	Do.
	II	1,073		
	III	1,146		
Mandaparai ..	I	894	Mandaparai	All footpaths running through the coupe which ultimately lead to the collection depot and thence along the Mandaparai-Burgur-Melarasampet road.
	II	1,066		
	III	789		

Name of felling series. (1)	Coupe. Number. (2)	Area, acres. (3)	Names of collection depots to which the produce should be transported. (4)	Extraction paths allowed. (5)
			Polur Range—cont.	
Palankottai ..	I	2,069	Komattiyur	All footpaths running through the coupe which ultimately lead to the collection depot and thence along Gilman road.
	II	4,486		
	III	864		
Thekumarathur.	I	723	Komattiyur	Do.
	II	506		
	III	934		
Modalapattu ..	I	410	Komattiyur	Do.
	II	506		
	III	1,038		
Odamangalam ..	I	1,210	Patrakad	All footpaths running through the coupe which ultimately lead to the collection depot and thence along the Patrakad-Chillimalai-Athimoor road.
	II	1,549		
	III	1,187		
Kuttakarai ..	I	2,641	Patrakad	Do.
	II	1,806		
	III	1,331		
Kondikallu ..	I	1,763	Pudur	All footpaths running through the coupe and along the Pillaiyarnathu path.
	II	2,047		
	III	1,734		
Vedatope ..	I	1,593	Pudur	Do.
	II	755		
	III	811		
Palanad ..	I	1,325	Irulavanka	Do.
	II	1,248		
	III	2,004		
			Tiruvannamalai Range.	
Valasamalai ..	I	1,952	Bhimarapatti	All footpaths running through the coupe and finally along— Coupe I, the footpaths running south of Velkal Hill and from Valasai Hill to the collection depot. Coupes II and III, the Gudaram-Ulchekkadi footpath.
	II	1,738	Ulchekkadi	
	III	1,414		
Nattampalli ..	I	1,350	Ulchekkadi .. .. Attipadi	All footpaths running through the coupes and finally along— Coupe I, the Ulchekkadi-Attipadi footpath. Coupe II, the Erkal-Attipadi, Erikal-Pudur-Chekkadi and Tekkampadi-Attipadi footpaths. Coupe III, the Kurumbagoundanur-Puddur-Chekkadi and Ayyambadi-Puddur-Chekkadi footpaths.
	II	1,178	Attpadi	
	III	1,274	Pudur	

Name of felling series.	Coupe. Number.	Coupe. Area, acres.	Names of collection depots to which the produce should be transported.	Extraction paths allowed.
(1)	(2)	(3)	(4)	(5)
			Tiruvannamalai—cont.	
Perunkolathur-swamimalai.	I	659	Neerkumri	All footpaths running through the coupe and finally along— Coupe I, the Kodiyanur-Kollukuthuppai footpath. Coupe II, the Swamimalai-Navakollai, the Nattaparai-Kodiyanur and the Ayyambadi-Kodiyanur footpaths. Coupe III, the Swamimalai-Navakollai footpath.
	II	1,075	Neerkumri, Navakollai	
	III	845	Navakollai, Kodiyanur	

341. *Regulation of fellings.*—Fellings will generally be carried out through the agency of contractors, one coupe in each felling series being worked annually. The District Forest Officer will however be given the discretion of selling bamboos departmentally should there be no competition at the sales or if he is opposed by an organised ring.

342. *Period of lease.*—The system of triennial leases now in force has much in its favour, but in certain circumstances annual leases are preferable. The decision as to which should be adopted is left to the District Forest Officer,who should however consult the Conservator before making a change in this respect. When flowering commences in any series it will be better if the coupes are sold annually, coupes being selected according to the intensity of flowering and excluded from working until the new crop becomes saleable.

SECTION 4.—TABULAR STATEMENT OF FELLINGS.

343. In view of the flowering and dying of bamboo definite coupes have not been allotted to definite years of working. Each felling series and its subdivision into coupes has been shown on the bamboo (and minor forest produce) working maps. Bamboo flowering centres, up to the end of March 1934, have also been shown. The current triennial leases expire on the 31st March 1938 in the Vellore and Odagathur ranges and on 31st March 1937 in the Polur, Santavasal and Tiruvannamalai ranges. Flowering has taken place extensively in the following coupes and it is probable that they may have to be excluded from working until the new crop becomes saleable.

Palavadi	Coupes I and II.
Vedatope	Coupe I.
Palankottai	Coupe II.

SECTION 5.—OTHER REGULATIONS.

344. *Hacking of (Dendrocalamus strictus).*—Mention has already been made in Part I (paragraphs 48, 79 and 173) of the most deplorable state of affairs brought about by the wholesale lopping and hacking of *Dendrocalamus strictus* by Malayalees for cattle fodder. Every grazier is allowed to carry a bill-hook in the forest and if this is prohibited much of the damage would disappear. In addition severe punitive action should be taken against the Malayalees by cancelling, either in whole or in part, the concession of free grazing in blocks where damage is bad.

345. *Overworking by contractors.*—Overworking and general non-observance of felling rules is due largely to the fact that the contractor grossly underpays his labour. On a wage of next to nothing the cutting coolie goes to the forest nearest his village, as near a road or cart-track as possible, and fells and removes as many culms as he can in the quickest and easiest way. The result is that the more accessible areas have been grossly overworked. The coolie is, in most cases, aware of the more important felling rules, but cannot posssibly observe them if he is to earn a living wage. Fellings are made over vast areas every year and it is an impossible task for the present staff to see that felling rules are enforced throughout the area. The remedy lies with the contractor and as it would be impracticable to insist on him paying his labour at a reasonable rate, the only solution is the imposition of heavy fines until he realises the cause of the trouble and takes steps to improve matters. Small fines have been imposed in the past, but appear to have had no effect.

346. *The construction of new roads and extraction cart-tracks.*—In a later chapter it is proposed to construct the following roads :—

(i) *Nadanur-Mandaparai road,* to tap the eastern slopes of the Veerappanur and Pudur reserves.

(ii) *Chinnayampettai-Ulchekkadi road,* to tap the inner slopes of the Ulchekkadi valley in the Natampalli and Valasamalai reserves.

It is hoped that the construction of these roads will bring about a more even distribution of working in these localities and the exploitation of areas from which extraction is at present difficult and expensive.

347. Before making a new cart-track either in or leading to his coupe or felling series the contractor shall obtain the District Forest Officer's approval for the proposed alignment. If required the Range Officer shall be instructed to align a suitable trace for him. The contractor will not be required to pay for the services of the Range Officer or his staff and an endeavour should be made to encourage the contractor to open up his area by rendering him all reasonable assistance.

348. *Experimental felling series.*—With a view to making an effort to enforce the felling rules, which have been simplified as far as possible, it is proposed to work experimentally, a felling series of strictly limited area in good and accessible bamboo forest. The proposed series is situated in coupe I of Kuttakarai felling series and is 405 acres in extent. The following are its boundaries.

North.—The southern boundary of Kuttakarai coupe II between the Patrakkadu-Kuttakkarai and Parappumadai-Kallathur footpaths.

East.—The Parappumadai-Kallathur footpath.

South.—The Patrakkadu-Chillimalai road.

West.—The Patrakkadu-Kuttakarai footpath.

349. The lease of the Kuttakarai series terminates on 31st March 1937, so that work in the experimental series will commence from 1st April 1937. The area of the experimental series will be deducted from the area of the regular Kuttakarai series, before the latter is put up for sale. Coupes will be sold annually and felling rules strictly enforced. If it is found that the series can be worked without difficulty, and all the felling rules observed, similar series should be opened elsewhere, starting with one in each range and then gradually increasing the number.

350. *Grazing.*—Grazing in bamboo areas where seeding has taken place must do a considerable amount of harm to the young regeneration. Nevertheless, it is believed that a sufficient quantity of seedings will survive to form the ultimate crop. Apart from this, the extent of the working circle is so large that even partial closure will cause great hardship to the local villagers. No grazing restriction is therefore proposed.

351. *Fire protection.*—The protection of the working circle is included in the general scheme of fire protection, which is dealt with under 'Miscellaneous Regulations.' Special measures for the protection of valuable sandal growth ocurring in areas where the bamboo has died have been prescribed in the working plan for the Sandal Working Circle.

352. It should be impressed upon the subordinate staff that special vigilance should be exercised during the fire season in areas where bamboo has died. Carts should not be permitted to remain in the forest during the night, but should be compelled to retire to the nearest enclosure. No fire, for cooking or any other purpose, shall be lighted in forest and anybody found doing so shall be severely dealt with.

CHAPTER V.—WORKING PLAN FOR THE MINOR FOREST PRODUCE WORKING CIRCLE.

SECTION 1.—GENERAL CONSTITUTION OF THE CIRCLE.

353. *General constitution.*—The Minor Forest Produce Working Circle comprises all the reserves of the division and will also include the unreserves in the following cases :—

(*a*) All the unreserves on the Javadi hills.

(*b*) All the unreserves for the purpose of avaram (*Cassia auriculata*) and konnai (*Cassia fistula*) bark leases.

354. *Sub-division of the area with reference to the various kinds of produce.*—A list of minor forest products has been furnished in paragraph 101 above. For the collection of barks and nux-vomica the unit of working will be a range. Quarries will be leased separately or in groups where there are more than one in a locality. For collection of other

kinds of produce the subdivision of the area into sixteen farms, prescribed in Mr. H. W. A-Gaudoin's wroking plan, will stand. This subdivision is set forth in the following statement and is shown on the minor forest produce working map :—

Serial number and range.	Farm.		
	Name of farm.	Area in acres.	Constitution.
(1)	(2)	(3)	(4)
1 Odagathur ..	Ambur	50,565	Vellakal reserve. Ambur fuel reserve. Ambur reserve. Shanankuppam reserve. Ambur plantation.
2 Do. ..	Karuthamalai ..	20,146	Karuthamalai reserve. Arasampattu resthouse compound.
3 Vellore	Alleri	15,435	Nellimalai reserve. Appukallu reserve. Arasampattu reserve, that part west of the Thattankuttai-Attiyur footpath.
4 Do.	Thellai..	18,218	Kylasagiri reserve. Attiyur reserve. Thellai reserve, that part situated in the Vellore range. Arasampattu reserve, that part east of the Thattankuttai-Attiyur footpath.
5 Santavasal ..	Odagathur	*17,092	Komiar bamboo felling series, Arasampattu reserve. Nayakanur bamboo felling series, Arasambattu reserve. Kudikam bamboo felling series, Arasambattu and Puttur reserves. Thongamalai bamboo felling series, Thellai and Puttur reserves.
6 Do.	Amerdi	22,145	Nikkini bamboo felling series, Puttur and Thellai reserves. Sathampattu bamboo felling series, Puttur, Thellai and Malayalam reserves. Kanamalai bamboo felling series, Malayalam reserve. Nadanur bamboo felling series, Malayalam and Puttur reserves. That part of the Thellai and Malayalam reserves, around and south of Amerdi, not included in any bamboo felling series.
7 Do. ..	Shembakatope ..	19,175	Puliyankuppam bamboo felling series, Malayalam reserve. Bonganur bamboo felling series, Malayalam reserve. Shembakatope bamboo felling series, Malayalam reserve. Santavasal bamboo felling series, Santavasal and Santavasal 'A' extension.
8 Do. ..	Santavasal	5,004	Santavasal reserve excluding Santavasal bamboo felling series, Santavasal 'B' extension.
9 Do. ..	Karnatigiri	7,270	Karnatigiri reserve.

*Four thousand three hundred and twenty-seven acres constituting the Komiar bamboo felling series, has been transferred to the Vellore range with effect from 1st September 1936, consequent to the alteration in the common boundary between the Santavasal and Vellore ranges.

Serial number and range.	Farm. Name of farm.	Area in acres.	Constitution.
(1)	(2)	(3)	(4)
10 Polur	Arasampattu	12,341	Veerappanur bamboo felling series, Veerappanur reserve. Mandaparai bamboo felling series, Veerappanur reserve. Pudupattu bamboo felling series, Arasambattu and Veerappanur reserves.
11 Do.	Komattiyur	12,663	Palankottai bamboo felling series, Veerappanur reserve. Tekumarathur bamboo felling series, Veerappanur reserve. Modalapettu bamboo felling series, Veerappanur reserve.
12 Do.	Chillimalai	23,793	Patrakad reserve.
13 Do.	Moolakad	15,529	Moolakad reserve. Moolakad rest house compound.
14 Do.	Periamalai	6,970	Periamalai reserve. Thaniar rest house compound. Athimoor rest house compound.
15 Tiruvannamalai ..	Ponniar	26,897	Ponniar reserve, that part situated in the Vellore East division.
16 Do.	Kalrayan	25,936	Valasamalai reserve. Natampalli reserve. Perungolathur Swamimalai reserve. Pavunjipattu reserve. Royandapuram reserve, that part not under panchayat management.

Note.—Farm numbers 5 to 14 also include small areas of unreserves situated on the Javadi hills.

The usufructs of 14 tamarind trees on the Santavasal-Shenbakatope road may be sold separately or with either the Santavasal or Shenbakatope farms.

355. In addition to the above the Banavaram reserve, 1,065 acres, and the following plantations will constitute separate units and may be sold separately or two or more together :—

	ACS.
Tiruvellam	464
Kilminal (bits 1 and 2)	150
Vannivedu	57
Virinchipuram	258
Chenur	130
Vikramachi	129
Ammundi	163

SECTION 2.—METHOD OF TREATMENT.

356. *Konnai bark* (*Cassia fistula*).—Konnai bark will be worked on a 5-year rotation as it has been found that the maximm production of tanning is obtained in this period Each range, including unreserves, except those under panchayat management, will be sold in auction in June every fifth year, but the period of collection will be for one year only, from the 1st of July in the year of the sale to the 30th of the following June.

357. *Avaram* (*Cassia auriculata*) *and Sural* (*Ventilago spp.*) *barks.*—Each range, including unreserves, except those under panchayat management, will ordinarily be sold in auction in June each year. If however there is a demand, and if the District Forest Officer considers it desirable, the right may be sold on a biennial or triennial lease. The lease period will begin on the 1st of July in the year of the sale. Each item may be sold separately or together.

358. *Quarries.*—The period of lease is left to the discretion of the District Forest Officer but it shall not exceed three years. The lease will begin, as in the case of other minor forest produce, on the 1st of July in the year of the sale.

359. *Other produce.*—The right to collect and remove all other produce will be sold in auction in June each year and the lease will be for one year from the 1st of July to the 30th of June. As a general rule each farm will be sold separately, but if occasion arises and the District Forest Officer deems it necessary, two or more farms may be clubbed together, or any particular product, for which a special demand may arise, sold separately. Nux vomica will be included with other produce in all ranges except Tiruvannamalai, where the range, including unreserves but excluding reserves under panchayat management, will be the unit of sale.

360. *Departmental working.*—Occasion may arise when for various reasons, at present unforeseen, it may become desirable to work any particular produce departmentally. It is therefore prescribed that, while exploitation through contractors should be the general rule, departmental working may be resorted to, with the prior sanction of the Conservator, whenever such a procedure seems necessary or expedient.

CHAPTER VI.—WORKING PLAN FOR THE GREEN LEAF MANURE WORKING CIRCLE.

SECTION 1.—INTRODUCTION.

361. The prescriptions for this working circle are based on the instructions issued in paragraph 2 of G.O. Mis., No. 2268, Development, dated 20th December 1929, in as far as they concern the Vellore East division. Briefly these instructions are that removals should be permitted in

(*a*) the reserves of the Vellore and Odagathur ranges (the Gudiyattam, Arkonam, Wallajapet and Vellore taluks of the old Vellore North division) at Re. 1–4–0 per cart-load, and

(*b*) those reserves of the Santavasal, Polur and Tiruvannamalai ranges (the old Vellore South division) which in the opinion of the Chief Conservator can be thrown open for such removals at Rs. 2 per cart-load.

362. From paragraph 3 of the same order it is seen that Government are not infavour of replacing the persent permit system by a system of annual coupes.

SECTION 2.—AREA AND CONSTITUTION OF THE CIRCLE.

363. The area of the working circle is 17,580 acres and it is composed of the following blocks :—

Serial number and name of block.	Situation.		Area, acres.
	Range.	Reserve.	
(1)	(2)	(3)	(4)
1 Appukal ..	.. Vellore	.. Appukal	1,030
2 Odagathur ..	.. Odagathur	.. Karuthamalai	1,130
3 Kuppampalayam	.. Do.	.. Shankuppam	830
4 Agaram ..	.. Do.	.. Do.	1,380
5 Pachakuppam ..	.. Do. ..	.. Do.	1,960
6 Nacharkuppam	.. Do.	.. Do.	1,510
7 Vinnamangalam	.. Do.	.. Vellakal	1,240
8 Attuparai ..	.. Santavasal	.. Malayalam	2,470
9 Santavasal ..	.. Do.	.. Santavasal	1,710
10 Periamalai ..	.. Polur	.. Periamalai	2,370
11 Kidampalayam	... Do.	.. Moolakad	320
12 Perunkolattur ..	.. Tiruvannamalai ..	.. Perungolattur Swamimalai.	1,630
		Total ..	**17,580**

Note.—These areas do not include the areas of fuel coupes from which the removal of green leaf is permitted. (*Vide* paragraphs 284, 285 and 288 above.)

364. In selecting these blocks the demand of villages served by panchayat reserves has not been taken into account and all areas set apart for the production of wood, i.e., sandal and fuel felling series, have been excluded. While adequate provision has been made to meet existing demands, in accordance with the orders of Government, the inclusion of extensive areas has been avoided, not only for the purpose of control, but also to reduce to a minimum the wholesale destruction of forest cover, which takes place during such removals. It would not be out of place to record here Mr. R. D. Richmond's view expressed in the recent correspondence on the subject of Forest cover as a factor in flood control, denudation a cause of soil erosion, etc., published in G.O. No. 465, Development, dated 17th April 1934. Mr. Richmond states "Manure leaf cutting is another factor to be taken into consideration. It leads to destruction but Government are unable to agree to its being put an end to."

SECTION 3.—METHOD OF TREATMENT.

365. *System.*—The coupe system is clearly the least harmful to the forest, but Government are definitely opposed to its introduction. There is therefore no alternative to the adoption of the permit system. In accordance with G.O. Mis. No. 2268, Development, dated 20th December 1929, permits will be issued at Re. 1–4–0 per cart-load for removals from the Vellore and Odagathur ranges and at Rs. 2 per cart-load for removals from the Santavasal, Polur and Tiruvannamalai ranges. Permits may be issued either departmentally, by rangers and foresters, or through the agency of contractors. The latter procedure is recommended in preference to the former, and whenever possible the right to sell permits at the specified rates in the prescribed blocks should be sold in auction annually as early as possible in June. The lease period will run from 1st July to 31st December.

366. *Rules regulating cutting and removal.*—The following will be included in the rules regulating cutting and removal irrespective of the Agency that sells the permits :—

(*a*) Only leaves and twigs not thicker than the little finger shall be cut.

(*b*) The following species are prohibited and shall not be cut :—

Sandal.
Teak.
Rosewood.
Pterocarpus marsupium.
Terminalia species.
Chloroxylon swietenia.
Anogeissus latifolia.
Albizzia amara.
Cassia siamea.

(*c*) Removals shall be by cart-loads and not by head-loads.

(*d*) Removals shall take place only between sunrise and sunset.

(*e*) Removals shall be restricted to villages which are not served by panchayat forests.

CHAPTER VII.—WORKING PLAN FOR THE GRAZING WORKING CIRCLE.

SECTION 1.—GENERAL CONSTITUTION OF THE CIRCLE.

367. The Grazing Working Circle comprises all the reserves of the division with the exception of the undermentioned areas.—

	ACS.
Banavaram reserve	1,065
Ambur plantation	6
Vannivedu plantation	57
Tiruvellam plantation	464
Kilminal plantation	150
Ammundi plantation	163
Virinjipuram plantation	258
Chenur plantation	130
Vikramachi plantation	129

SECTION 2.—METHOD OF TREATMENT.

368. *Introduction.*—The damage caused by grazing has been referred to in paragraphs 84 and 85 above. It has also been shown that the grazing incidence is dangerously high, but it is doubtful if the present policy of Government will permit of any reduction in the number of cattle which are grazed annually in reserves. Provision must therefore be made to meet the full grazing requirements of villages dependent on reserves for pasture.

369. The objects of management are thus ;

(i) to provide pasture for the cattle of villages in the vicinity of reserves and in the enclosures situated therein, consistent with the protection of newly felled areas, and to derive a legitimate amount of revenue.

(ii) to control the exercise of grazing concessions granted to the Malayalees in the hill villages of the Vellore, Santavasal and Polur ranges.

370. *Prescriptions.*—The following general prescriptions will apply throughout the working circle :—

(i) The grazing year will be from 1st July to 30th June.

(ii) Goat browsing will not be allowed.

(iii) Worked fuel coupes will be closed to grazing for a period of seven years, including the year of felling.

Detailed prescriptions vary with the area, depending on whether grazing concessions exist or not, and are dealt with in the following sections.

SECTION 3.—AREAS WHERE NO GRAZING CONCESSIONS EXIST.

371. In areas where no concessions exist, grazing will be regulated by the *issue of permits* subject to the usual conditions. The rates charged will be those sanctioned by the Government from time to time. A distinction is made between 'local' and 'foreign' cattle, the rates for the latter being double those for the former. No authoritative definitions of 'local' and 'foreign' cattle, as applicable to the division hitherto, can be traced. The present procedure is to class as 'local', cattle which remain in the division throughout the year, all others being 'foreign'. The following definitions are now prescribed (vide Chief Conservator's No. 7077/37-C-1, dated 2nd September 1937) :—

Local cattle.—Cattle whose owners reside within the limits of the Forest division.

Foreign cattle.—Cattle whose owners reside outside the limit of the Forest Division.

372. Permits will be valid for one season only and will be issued by an officer not below the rank of forester.

SECTION 4.—GRAZING CONCESSIONS.

373. The following concessions will continue :—

(i) *Free grazing under the 'Forest Village System' by the Malayalees of the Javadi hills in the Santavasal and Polur ranges (G.O. No.* 2687, *dated* 3rd *December* 1915) *and of that part of the Thellai reserve situated in the Vellore (Old Odagathur) range (Chief Conservator's Ref. No.* 4411/37-C-2, *dated* 16*th December* 1937).

(ii) *Grazing on payment of half the usual fees by the Malayalees of the Attiyur and Arasampet reserves of the Vellore range (G.O. No.* 1720, *dated* 25*th May* 1910).

Free grazing under the 'Forest Village System' by the Malayalees of the Javadi hills in the Santavasal and Polur ranges, and of that part of the Thellai reserve situated in the Vellore (Old Odagathur) range.

374. *Terms of concession.*—These have been dealt with in paragraphs 39 (*a*) and 120 above. No alteration or modification is called for.

375. *Grazing blocks.*—The 152 grazing blocks into which the area has already been divided will continue. The statement below sets forth the names and areas of the blocks, the reserves in which they are situated and the village or villages to which each has been allotted. Tracings of the blocks, from 4 inches Survey of India sheets, have been recorded in the control journals for the Santavasal and Polur ranges and this will be done for the Vellore range also. It has therefore been considered unnecessary to furnish boundary descriptions here or to provide a working map for the control of grazing.

List of grazing blocks under the 'Forest Village System' in the Santavasal and Polur ranges.

Serial number.	Grazing block. Name.	Area, acres (reserve only).	Name of reserve or reserves in which situated.	Name of village or villages to which allotted.
(1)	(2)	(3)	(4)	(5)
			Santavasal Range.	
1	Yelavandapudur	578	Arasampattu and Thellai.	Yelavandapudur.
2	Muthanur	640	Arasampet	Muthanur.
3	Ellupparai	142	Do	Ellupparai.
4	Nayakanur	652	Do.	Nayakanur.
5	Kavaliyur	148	Do.	Kavaliyur.
6	Sinnattipatti	200	Thellai	Sinnattipatti.
7	Kunrani	450	Do.	Kunrani.
8	Eladimarathur	350	Do.	Eladimarathur.
9	Periya Ettipatti	315	Thellai and Puttur	Periya Ettipatti.
10	Thethur	50	Puttur	Thethur.
11	Konur	60	Do.	Konur.
12	Chengadu	200	Do.	Chengadu and Tekumarathur.
13	Thongamalai	350	Do.	Thongamalai.
14	Mulanur	475	Do.	Mulanur.
15	Pilliyar kuttai	140	Arasampet	Pilliyar kuttai
16	Selathur	84	Do.	Selathur.
17	Tenandur	175	Arasampet and Puttur	Tenandur and Korathur.
18	Pudur	538	Do.	Pudur.
19	Pinjamanthai	440	Arasampet	Chinnapinjamanthai and Periapinjamanthai.
20	Kunikanur	220	Do.	Kunikanur.
21	Periakottanchetti	184	Do.	Periakottanchetti.
22	Sinnakottanchetti	200	Do.	Sinnakottanchetti.
23	Narasimadubu	50	Do.	Narasimadubu.

Serial number. (1)	Grazing block. Name. (2)	Area, acres (reserve only). (3)	Name of reserve or reserves in which situated. (4)	Name of village or villages to which allotted. (5)
			Santavasal Range—cont.	
24	Kattiyapattu	530	Arasampet	Kattiyapattu and Pallandur.
25	Kuppachiyur	286	Do.	Kuppachiyur.
26	Puliyamarathur ..	750	Arasampet and Puttur ..	Puliyamarathur.
27	Kudigam	560	Puttur	Kudigam.
28	Koraimadubu	275	Do.	Koraimadubu.
29	Periapanapparai ..	850	Do.	Periapanapparai.
30	Chinnapanapparai ..	175	Do.	Chinnapanapparai.
31	Chinnur	350	Do.	Chinnur.
32	Puttur	425	Do.	Puttur and Desariputtur.
33	Namiyampattu	975	Do.	Namiyampattu.
34	Periaveerappattur ..	190	Do.	Periaveerappattur.
35	Velliyur	300	Do.	Velliyur.
36	Kattayangudisi	150	Do.	Kattayangudisai and Kabadigudisai.
37	Melkuppachinur ..	600	Puttur and Thellai ..	Melkuppachinur.
38	Pelamuthu	697	Do. ..	Pelamuthu and Salathumadugu.
39	Nikkini	1,100	Thellai	Nekkini and Thanimarathur.
40	Kolayam	432	Do.	Kolayam and Kuranur.
41	Kanamalai	650	Malayalam	Kanamalai.
42	Arasanur	520	Do.	Arasanur.
43	Elanthampattur ..	740	Do.	Elanthampattur.
44	Kilkuppachinur ..	350	Puttur	Kilkuppachinur, Sinnabeerappattu and Patrayangudisai.
45	Mothalamadubu ..	125	Do.	Mothalamadubu.
46	Sernankuppam	425	Puttur and Thellai ..	Sernankuppam and Melsernankuppam.
47	Thathankuppam ..	125	Do. ..	Thathankuppam.
48	Pattanur	312	Puttur, Thellai and Malayalam.	Pattanur.
49	Sinthanikuppam ..	40	Puttur	Sinthanikuppam.
50	Muthanathur	320	Puttur and Malayalam ..	Muthanathur.
51	Nadupat	40	Thellai	Nadupat.
52	Nadanur	150	Puttur	Nadanur.
53	Eriyur	250	Do.	Eriyur.
54	Sinnamachur	45	Do.	Sinnamachur.
55	Seramarathur	100	Do.	Seramarathur.
56	Padavanur	170	Do.	Padavanur.
57	Kovilur	50	Do	Kovilur and Chinnakovilur.
58	Koilandur	275	Do.	Koilandur.
59	Kumbilur	425	Do.	Kumbilur.
60	Valathumbi	775	Do.	Valathumbi.
61	Pallathur	320	Malayalam	Pallathur and Avaram. valasai.
62	Nagalur	260	Do.	Nagalur.
63	Nirthumbi	600	Do.	Nirtumbi.
64	Murukkamandai ..	1,280	Do.	Murukkamandai and Melmurukkamandai.
65	Malligimaduvu	172	Do	Malligimaduvu.
66	Kanavayur	450	Do.	Melkanavayur.
67	Puliyankuppam ..	750	Do.	Puliyankuppam and Melpuliyankuppam.
68	Kammampattu	200	Do.	Kammampattu.
69	Sengadu	400	Do.	Sengadu.
70	Puduppattuvali ..	150	Do.	Puduppattuvali.
71	Bonganur	470	Do.	Bonganur.
72	Periyavali	660	Do.	Periyavali.
73	Pathimala	600	Do.	Pathimalai.
74	Periyamachur	30	Puttur	Machur.
75	Thoniyur	40	Thellai	Thoniyur.
76	Sathamppattu	498	Thellai and Malayalam ..	Sathampattu.
77	Palapparampattu ..	2,474	Do. ..	Palapparampattu.
78	Amerdi	1,200	Do. ..	Amerdi.
79	Poosangundanvalasai ..	700	Puttur and Thellai ..	Poosangundanvalasai

Serial number. (1)	Grazing block. Name. (2)	Area, acres (reserve only.) (3)	Name of reserve or reserves in which situated. (4)	Name of village or villages to which allotted: (5)
			Polur Range.	
80	Komittiyeri	900	Verappanur	Komittiyeri.
81	Melkomittiyur	204	Do.	Melkommittiyur.
82	Velikottai	240	Do.	Velikottai.
83	Palankottai	900	Do.	Palankottai.
84	Gunikanur	450	Do.	Gunikanur.
85	Mamarathur	302	Veerappanur and Patrakad.	Mamarathur.
86	Kuriyanur	132	Veerappanur	Kuriyanur.
87	Melnellimarathur ..	375	Do.	Melnellimarathur.
88	Erinellimarathur ..	200	Do.	Erinellimarathur.
89	Keelur	430	Do.	Keelur.
90	Seramarathur	340	Veerappanur and Patrakad.	Seramarathur.
91	Jambodi	300	Do.	Jambodi.
92	Tekamarathur	380	Veerappanar	Tekamarathur.
93	Gundalattur	186	Veerappanur and Patrakad.	Gundalattur.
94	Berinellimarathur ..	440	Veerappanur	Berinellimarathur.
95	Perungattur	885	Patrakad and Veerappanur.	Perungattur.
96	Alanjanur	460	Veerappanur	Alanjanur.
97	Chintalur	500	Do.	Chintalur.
98	Kanaganeri	326	Do.	Kanaganeri.
99	Markanur	530	Do.	Markanur.
100	Pakkamadayanur ..	560	Do.	Pakkamadayanur.
101	Jamnamarathur ..	1,580	Do.	Jamnamarathur.
102	Mandaparai	900	Do.	Mandaparai.
103	Kallaparai	310	Do.	Kallaparai.
104	Melmarathur	452	Do.	Melmarathur.
105	Jadayanur	560	Do.	Jadayanur.
106	Arasavali	500	Do.	Arasavali.
107	Burgur	2,630	Do.	Burgur.
108	Ettimarathur	936	Do.	Ettimarathur.
109	Puduppattu	3,450	Do.	Puduppattu.
110	Vilankuppam	1,180	Do.	Vilankuppam.
111	Thithanur	1,120	Veerappanur and Patrakad.	Thithanur.
112	Veerappanur	430	Veerappanur	Veerappanur
113	Jonur	260	Do.	Jonur.
114	Periyamalai	608	Patrakad	Periyamalai.
115	Thumbakkollai	432	Do.	Thumbakkollai.
116	Odamangalam	1,376	Do.	Odamangalam.
117	Peruvali	764	Do.	Peruvali.
118	Padri	268	Patrakad and Veerappanur.	Padri.
119	Manjuthu	230	Patrakad	Manjuthu.
120	Kuttakarai	2,350	Do.	Kuttakarai.
121	Pattankovilur	360	Do.	Pattankovilur.
122	Kallathur	476	Do.	Kallathur.
123	Patrakad	662	Do.	Patrakad.
124	Kondikallur	1,700	Patrakad and Moolakad ..	Kondikallur.
125	Melchippalli	1,350	Do. ..	Melchippalli.
126	Kilchipalli	1,752	Moolakad	Kilchipalli.
127	Pudur	1,260	Patrakad	Pudur and Mamarathur.
128	Ambattankollai ..	930	Do.	Ambattankollai.
129	Vedatope	400	Do.	Vedatope.
130	Koyilanur	940	Do.	Koyilanur.
131	Athipattu	500	Veerappanur	Athipattu.
132	Koyilur	480	Veerappanur and Patrakad.	Koyilur.
133	Mattukanur	440	Veerappanur	Mattukanur.
134	Dombarathu	420	Veerappanur and Patrakad.	Dombarathu.
135	Thanjankollai	1,660	Do.	Thanjankollai.
136	Mothalappattu	720	Veerappanur	Mothalappattu.
137	Mamarathur	250	Do.	Mamarathur.
138	Kilthattiyapattu ..	136	Patrakad	Kilthattiyapattu.
139	Palveri	1,004	Patrakad and Mulakad ..	Palveri.
140	Gumbalamarathur ..	452	Veerappanur	Gumbalamarathur.
141	Jeemarathur	765	Veerappanur and Patrakad.	Jeemarathur.
142	Attiyanur	944	Do.	Attiyanur.
143	Mullipattu	280	Do.	Mullipattu.
144	Pelavadi	940	Patrakad	Pelavadi.
145	Nasimalaikottai ..	480	Veerappanur	Nasimalaikottai.
146	Thumbakad	808	Malayalam and Mulakad ..	Thumbakad.

Serial number. (1)	Grazing block. Name. (2)	Area, acres (reserve only.) (3)	Name of reserve or reserves in which situated. (4)	Name of village or villages to which allotted. (5)
			Vellore Range.	
147	No. I	894	Thellai	Periyathathankuttai.
148	No. II	1,020	Do.	Sinnathathankuttai and Jarathankollai.
149	No. III	1,223	Do.	Thellai, Muthangudisai and Kadugamarathur.
150	No. IV	680	Do.	Neeplambat and Kondathur.
151	No. V	2,085	Do.	Erimodu and Pattigudisai.
152	No. VI	751	Do.	Pudur, Kanisai and Chinnakanisai.
	Total area ..	**88,565**		

376. *Refund of grazing fees.*—It has been customary in the past to refund grazing fees at the time when rewards for successful fire protection are disbursed. This custom will continue. In a later chapter it is prescribed that fire protection rewards shall be paid early in October each year. The grazing year ends on the 30th June, so that a clear period of three months remains for inspection of grazing blocks by Range officers, the submission of their reports on the degree of protection and co-operation attained and receipt of the Conservator's sanction, which is necessary before the refunds can be made.

377. *Thellai reserve.*—In C.C.P. No. 324, Miscellaneous, dated 13th July 1922, the 'Forest Village System' was tentatively introduced in that part of the Thellai reserve situated in the Vellore (Old Odagathur) range. Prior to that date the villagers in question enjoyed the concession of grazing their cattle in the reserves on payment of half the usual fees on the terms noted in the preceding paragraph. The extra terms imposed on them by the 'Forest Village System' were that they should tend sandalwood and introduce timber species. Sandal is confined to one grazing block and covers an area of only 800 acres approximately. The average quantity of dead wood extracted annually for the last three years is 48 quarters. The villagers are paid the usual rates for extraction and rough cleaning of sandalwood and the little tending the species may require, during the period of this plan at any rate, is practically negligible. The locality is unsuitable for the introduction of timber species. It is thus seen that the advantages derived from the system are not commensurate with the loss sustained in the shape of grazing fees. It is however now considered that the present staff will not be able to protect this additional area (6,653 acres) should the protection now afforded under the Forest Village System be withdrawn. The appointment of the additional staff required will entail a net loss of about Rs. 50 annually. Further, it seems objectionable to withdraw a concession which has been enjoyed for over 15 years. It has therefore been decided that the present system should continue in the area (Chief Conservator's Reference No. 4411/37-C-2, dated 16th December 1937).

Grazing on payment of half the usual fees by the Malayalees of the Attiyur and Arasampet reserves of the Vellore range.

378. *Terms of the concessions.*—These are, that the Malayalees, in return for being allowed to graze their cattle at half rates, will—

(i) Do all in their power to prevent fires and if there is a fire they will take prompt steps to extinguish it.

(ii) On no account damage by hacking or otherwise sandalwood trees growing in reserves, unreserves and patta lands.

(iii) Not hack bamboos for the purpose of feeding cattle.

(iv) Not keep a larger number of goats than necessary for domestic purposes and will see that they do not browse in reserves.

(v) Not permit ryots from the plains to pen cattle within their village limits unless they produce an order from the District Forest Officer permitting them to do so. In any case they will report the arrival of such cattle as soon as possible to the Range Officer.

The concession may be withdrawn at once if any of the above conditions are violated.

SECTION 5.—SUBSIDIARY MEASURES FOR IMPROVEMENT.

379. *Closure of burnt areas.*—The prevalence of grazing is closely associated with deliberate setting of fire by graziers with the object of obtaining the tender grass which comes up in the first rain after the burn. The damage caused by fire has been dealt with

elsewhere. It is possible to mitigate the harmful results by closing burnt areas to grazing. It is therefore prescribed that, when a burnt area is extensive and the damage to the growth serious enough, the District Forest Officer (who must be the judge in such matters) will, immediately on receipt of the Range Officer's fire occurrence report, apply to the Collector for the closure to grazing of the burnt area for an adequate period, in sufficient detail to enable him to pass orders without further reference, and request urgent orders. The Collector will pass orders at once and forward a copy of his order to the Chief Conservator for concurrence.

380. *Improvement of watering facilities.*—It is desirable that the existing tanks and wells situated within the reserves, should be kept in repair by the department. Most of the tanks carry water for a few weeks only after rains, while many of the wells run dry in the hot weather, when the need for watering facilities is most keenly felt. It is therefore prescribed that repairs to the tanks and wells set forth in the following statement will be carried out during a period of five years, commencing if possible in 1936–37. The estimated cost for the work is Rs. 2,780, while the annual expenditure is Rs. 580 in the first year and Rs. 550 thereafter for the next four years :—

Name of tank or well.	Situation.		Nature of work required.	Estimated Amount.
	Range.	Reserve.		
(1)	(2)	(3)	(4)	(5)
		1936–37.		RS.
Solappanaickan (well).	Odagathur ..	Ambur	Silt clearance ..	50
Goddukinar (well) ..	Do. ..	Arasampet ..	Deep silt clearance and repairs in a few places to stone revetments.	100
Vannankulam (tank).	Do. ..	Athiyur	Silt clearance ..	50
Karuthamalai (well).	Do. ..	Karuthamalai ..	Deepening in rocky soil.	50
Komattikulam (tank).	Do. ..	Nellimalai ..	Silt clearance ..	50
Mullapadi (well) ..	Santavasal ..	*	Deep silt clearance ..	100
Anaikuttai (small tank).	Tiruvannamalai.	Ponniar	Silt clearance and repairs to earth bund.	50
Elandaikuttai (small tank).	Do.	Do.	Silt clearance ..	30
Veppankuttai (small tank).	Do.	Do.	Do. ..	50
Samaikuttai (small tank).	Do	Perungolattur Swamimalai.	Do. ..	50
			Total ..	**580**
		1937–38.		
Chinnakinar (well) ..	Odagathur ..	Arasampet ..	Deepening in rocky soil (part).	100
Chichappakulam (tank).	Do. ..	Do. ..	Silt clearance ..	50
Eesappanaicken (well).	Do. ..	Kylasagiri ..	Do. ..	50
Sathampet (well) ..	Santavasal ..	†	Repairs to masonry cattle trough and purchase of pulley.	50
Thethikulam (tank) ..	Do. ..	Karnatigiri ..	Silt clearance and repairs to bund (part).	100
Servaneri (tank) ..	Tiruvannamalai.	Ponniar	Deep silt clearance and repairing portions of rough stone revetment of bund (part).	100
Ettikuttai (small tank).	Do.	Do. ..	Silt clearance ..	50
Kanavoikinar (well) ..	Do.	Perungolattur Swamimalai.	Do. ..	50
			Total ..	**550**
		1938–39.		
Chinnakinar (well) ..	Odagathur ..	Arasampet ..	Deepening in rocky soil (completion of work started in 1937–38).	200
Thethikulam (tank) ..	Santavasal ..	Karnatigiri ..	Silt clearance and repairs to earth bund (completion of work started in 1937–38).	200

* Near Kudikam. † In Amardi valley.

Name of tank or well. (1)	Situation. Range. (2)	Reserve. (3)	Nature of work required. (4)	Estimated amount. (5)
				RS.
Servaneri (tank) ..	Tiruvannamalai.	Ponniar	Deep silt clearance and repairing portions of rough stone revetment of bund (completion of work started in 1937–38).	100
Annaperumankuttai (small tank).	Do.	Do.	Silt clearance and repairs to bunds.	50
			Total ..	550
		1939–40.		
Kanjipatam thoravi (well).	Odagathur ..	Athiyur	Silt clearance and repairs to well lining.	100
Thandrevu (well) ..	Do. ..	Karuthamalai ..	Silt clearance and deepening.	100
Kallaparai (well) ..	Do. ..	Ambur	Do.	100
Settikinar (well) ..	Do. ..	Do.	Do.	100
Vellaikulam (tank) ..	Tiruvannamalai.	Pavunjipettu ..	Silt clearance ..	50
Vediyappankulam (tank)	Do.	Ponniar	Do. ..	50
Vetteri (tank) ..	Do.	Do.	Do. ..	50
			Total ..	550
		1940–41.		
Kilavankulam (tank).	Santavasal ..	Karnatigiri ..	Deep silt clearance and repairs to earth bund.	300
Settikulam (tank) ..	Tiruvannamalai.	Ponniar	Silt clearance ..	50
Vedippattikulam (tank).	Do.	Do.	Do. ..	50
Kariyankinar (well) ..	Do.	Pavunjipettu ..	Do. ..	50
Puliyankuttai (small tank).	Do.	Perungolattur Swamimalai.	Do. ..	50
Ayambadi (well) ..	Do.	Do.	Do. ..	50
			Total ..	550
			Grand total ..	2,780

SECTION 6.—CUTTING AND REMOVAL OF GRASS FROM RESERVED FORESTS.

381. *Cutting and removal of grass from reserved forests under the control of the Forest department.*—(i) Cutting and removal of grass in head-loads are permitted from the reserved forests except in areas which are closed for silvicultural or other reasons. The removal of grass shall be allowed free only in head-loads and for bona fide domestic use and not for sale. Removal in cartloads may be made only from areas in which it is specially allowed on payment of the prescribed fee.

(ii) No removal will be permissible from coupes under felling, in young plantations, in sandalwood propagation centres, areas closed to grass-cutting and other areas closed by the District Forest Officer for special reasons. Removals may be made throughout the year but they shall not be made before dawn or after dusk. No permits will be required. In case of contract, the lessee will be required to agree to free removal by the public in head-loads.

(iii) The concession and the closed areas as well as the recognized footpaths or roads will be notified by the District Forest Officer annually in the District Gazette. Removals shall be made only through recognized footpaths or roads.

(iv) Long grass alone may be cut. It shall not be uprooted. Sickles shall be used. Billhooks and felling axes shall not be carried. No forest produce shall be cut to stiffen or to tie the bundles.

(v) Head-loads and cart-loads should be presented for inspection when demanded by a Forest subordinate.

(vi) The grass shall not be set on fire either wilfully or negligently and no combustible material shall be taken into the forest; if fire breaks out the grass-cutters shall make every endeavour to extinguish it.

(vii) The concession is liable to be terminated for serious breach of any of the conditions mentioned above or in the event of the occurrence of any serious fire, under the orders of the District Forest Officer, who shall report the fact to the Collector for approval within ten days.

382. *Fodder supply from forest areas.*—In accordance with Recommendation IV of the Agricultural Commission (C.C.P. No. 439, Miscellaneous, dated 21st November 1928) the annual leases for the removal of hay by the Military Grass Farms from the Banavaram reserve, the Chennur plantation, and any other locality where a demand may arise, will continue. Cutting and removal will be restricted to the period 1st July to 15th March each year and necessary precautions will be taken to protect buildings and forest growth from fire risk.

SECTION 7.—OTHER REGULATIONS.

383. *Demarcation of closed areas.*—Areas closed to grazing will be indicated in the forest by means of red sign boards placed at as many points as may be necessary.

CHAPTER VIII.—MISCELLANEOUS REGULATIONS.

SECTION 1.—FIRE PROTECTION.

384. *General.*—The system of fire protection prescribed below is the same as that which has been in use hitherto, except that—

(i) the necessity for the rigid protection of Specially Protected Blocks in the Sandal Working Circle (*vide* paragraph 153 above) no longer exists, the selection and tending of such blocks having been discontinued,

(ii) the Gangavaram and Karnatigur fire lines need not be maintained. The positions of these lines and the fact that neither are of much value has been discussed in paragraph 215 (*a*) (ii) above.

385. *Prescriptions.*—The system prescribed falls under two heads, Special and General. The former involves the allocation of definite areas to definite villages and the payment of rewards for successful protection; while in the latter, important roads, cart-tracks and foot-paths will be fire traced as early as possible in the fire season and the local subordinates held generally responsible for protection. Details relating to Special and General protection are given below:—

Special protection.

386. *Areas in which undertaken and their subdivision.*—The areas in which Special protection will be undertaken and their subdivision for allocation to the several villages are set forth below:—

(i) *Santavasal, Polur and Vellore ranges.*—88,565 acres, comprising the Javadi hill reserves and that part of the Thellai reserve which comes under the Forest Village System. The unit of protection will be the grazing block. A list of grazing blocks, of which there are 152, is given in the statement in paragraph 375 above. The statement also gives the area of each block and the name of the village or villages, to which it is allotted.

(ii) *Tiruvannamalai range.*—18,900 acres, comprising the Valasamalai, Natampalli and Perungolathur Swamimalai reserves on the Kalroyan hills. Although the villages on these hills do not come under the Forest Village System, each village has been held responsible for protection within its own limits and has been paid rewards. This will continue and the unit of protection will, as hitherto, be the limits of the individual village. The names of the villages with their corresponding areas are given below:—

Valasamalai Reserve.

	ACS.		ACS.
Bimarapatti	1,300	Chinnavalasai..	2,500
Gurukkalamanavur	300	Ulchekkadi	1,700
Melavalasai	1,800		

Natampalli Reserve.

Ulchekkadi	800	Pudduchekkadi	900
Attipadi	1,200	Kalnatur	500
Puliyampatti	1,300	Nerkunni	500

Perungolathur Swamimalai Reserve.

	ACS.		ACS.
Navakkal	2,600	Kodiyanur	1,800
Puliankottai	1,200	Thoduthampaliyam	500

Note.—Areas are given to the nearest 100 acres.

387. *Fire lines.*—On the Javadi hills no fire lines are prescribed as fires are generally internal in origin. On the Kalroyans however there is always the risk of fires crossing over from the ***Ponnankad*** * cultivation which is common in the Jagir forests lying to the south of the Valasamalai, Nattampalli and Perungolathur Swamimalai reserves. It is therefore prescribed that the following reserve boundary lines, constituting a part of the southern boundary of the division, be cleared and burned annually :—

	Approimate length.
	MILES.
(i) The western and southern boundaries of the Valasamalai reserve, from just south of the Tettarai Odai stream in the north-west corner to the point where the southern boundary meets the south-west corner of the Nattampalli reserve	10
(ii) The southern boundary of the Nattampalli reserve	$5\frac{1}{4}$
(iii) The southern boundary of the Perungolathur Swamimalai reserve from the south-west corner to the point where it meets the western extremity of the Pavunjipettu reserve	$1\frac{1}{4}$

The clearing and burning of these lines will be done by the villagers, who are willing to do the work if they are paid a reasonable fire reward.

388. *Fire rewards.*—As already stated in an earlier chapter the rewards paid in the past were based on no definite rate and varied from 4 annas per 100 acres in the Polur range to Rs. 1–15–0 per 100 acres in the Santavasal range. Enquiries made in the villages indicate that Re. 1 per 100 acres is a reasonable rate. It is therefore prescribed that the rewards for the several units of protection, the areas of which have been given in paragraph 386, be calculated at this rate. The total area to be protected is 107,465 acres, or say 107,500, so that the maximum amount of rewards payable in any year will be Rs. 1,075. The corresponding figure for the five-year period 1930–1934 is Rs. 911–15–7. The small increase is considered necessary as a lower rate would not be a sufficient inducement for the villages to co-operate willingly.

389. *Fines for bad protection.*—It is prescribed that the West Vellore method of calculating, by the following formula, the fines to be imposed each year for bad protection be adopted. The formula was devised by the District Forest Officer, Khan Sahib Muhammad Habib-ul-lah Sahib Bahadur, and is based on the assumption that payment of rewards to any village is not justifiable if one quarter, or more, of the area of forest allotted to it is burned during the year.

Formula.

$$\text{Fine} = R - \frac{[A - (B \times 4)] \times R}{A}, \text{ where}$$

R = the maximum reward in rupees fixed for the village.

A = the area of forest in acres allotted to the village.

B = the number of acres in A which were burned during the year.

R and A are constants and it has been prescribed above that R shall be calculated at a rate of Re. 1 per 100 acres.

Example.—The area allotted to Bimarappatti village of the Tiruvannamalai range is 1,300 acres. The maximum reward payable at Re. 1 per 100 acres is Rs. 13. It is assumed that 100 acres has been burnt during the year. The fine to be deducted from the maximum reward payable is thus :—

$$\text{Rs. } R - \frac{[A - (B \times 4)] \times R}{A}$$

$$\text{Rs. } 13 - \frac{[1{,}300 - (100 \times 4)] \times 13}{1{,}300}$$

$$\text{Rs. } 13 - \frac{[1{,}300 - 400] \times 13}{1{,}300}$$

* Dry cultivation in which Timber species are raised with the field crop.

$$\text{Rs. } 13 - \frac{900 \times 13}{1,300}$$

Rs. 13 — 9
Rs. 4.

390. *Payment of rewards.*—There is occasional risk from fire in June, but after the end of June it may be taken that the forests are safe from fire. Burnt areas will have been inspected shortly after the occurrence of each fire and reports submitted from time to time during the fire season. It is important that as short a time as possible should lapse between the close of the fire season and the disbursement of rewards for successful protection, so that the object of paying rewards and the reasons for imposing fines are still fresh in the minds of the villagers. Reward lists will therefore be submitted by Range Officers early in August; and, allowing for unforeseen delays and the time required for obtaining the Conservator's sanction, rewards will be disbursed early in October, that is three months after the close of the fire season and not twelve months or so as is customary at present.

General Protection.

391. *Areas in which undertaken.*—General protection will be undertaken in all areas where Special protection is not prescribed.

392. *Fire-tracing important roads, cart-tracks and footpaths.*—The following roads, cart-tracks and footpaths will be fire traced to a width of half a chain on either side. The work will be done as early as possible in the fire season. The cost will be about Rs. 2 per mile.

Name and description.	Approximate length.
	MILES.
Odagathur Range.	
Ambur-Asanampet road from where it crosses the Aniamadukan Ar, one mile east of the Ambur rest-house to where it crosses the Tirtham Ar on the easte n boundary of the Ambur reserve.	10
Asanampet-Alangayam cart-track from where it enters the Ambur reserve as far as the district boundary.	1¾
Ambur-Niakaneri footpath for the distance it passes through the Ambur reserve.	3
Sholavaram-Vellakal footpath for the distance it passes through the Attiyur reserve.	1¼
Attiyur-Karumalai footpath for the distance it passes through the Attiyur reserve.	1¾
Santavasal Range.	
Karnatigur bridle path for the distance it passes through the Karnatigur reserve.	4

SECTION 2.—EXPERIMENTS.

393. *Red sanders* (Pterocarpus Santalinus) *increment plot.*—It is proposed that a sample plot be laid out in the red sanders area in Chenur plantation to study the mean annual increment of the species. The plot should be of such a size that at least 20 trees of each 6 inch girth class are represented. Saplings below 12 inches in girth should be omitted. The selection of the plot will be done in consultation with the Provincial Silviculturist. Trees under observation will be ringed with white paint and marked by metal discs with the numbers stamped on them and secured to the trees by means of wire. Trees will be measured in February every year and their girths recorded in the following form. Measurement will be to the nearest half inch.

Tree number.	Girths at each observation.										Remarks.
	*	*	*	*	*	*	*	*	*	*	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

* Denotes dates of measurements.

SECTION 3.—ROADS, BUILDINGS AND WELLS.

394. *Existing roads.*—All existing roads, a list of which has been given in paragraph 219 above, will be kept in a state of repair. The Chillimalai-Patrakad ghat road (item 13 on the list) has recently been repaired at a cost of Rs. 1,600, numerous slips having been cleared and zigs widened. This road is the only outlet from the Javadi plateau eastwards to Polur and thence to outside markets by railway. Some thousands of cart-loads of bamboos pass along the road annually and the prices realized for bamboo coupes depend to a very large extent on its condition. It is thus most important that it should always be kept in a state of repair. Similarly the cart-track from Burgur to Arasampet (the last item on the list) is another important extraction route for bamboos. It is in very bad condition and is being repaired by bamboo coupe contractors from time to time. It is proposed that it should be taken over by the department and, like the Patrakad-Chillimalai road, maintained in a saticfactory condition. It will probably require realigning in places.

395. *Proposed roads.*—The construction of the following new roads is proposed :—

(i) From Nadanur to Mandaparai in the Santavasal and Polur ranges.

(ii) From Tanipadi to Ulchekkadi in the Tiruvannamalai range.

396. *Nadanur-Mandaparai road.*—This road will tap the valuable bamboo forests on the eastern slopes of the Veerappanur and Puthur reserves. The approximate length of the alignment is 6 miles 5 furlongs of which 1 mile 1 furlong at the Mandaparai end has already been constructed. The estimated cost of construction is Rs. 12,550, but the estimate is under revision by the Forest Engineer.

397. *Tanipadi-Ulchekkadi road.*—The construction of this road was originally considered in connexion with a resolution moved in the Legislative Council by Mr. M. B. Rangaswami Reddi, M.L.C., who was of opinion that the road would serve as an extraction route for sandalwood, teak and other valuable timber, which (he thought) were found in abundance on the Valasamalai plateau in the Kalroyan hills. Actually, sandal is limited to an area of some 800 acres around the Valasamalai enclosure and the annual yield from the locality will be only a few hundredweights annually. Teak and other timber species, although well represented, are not worth extracting—vide paragraphs 54 and 55 above. The road will however facilitate the extraction of bamboos from the Valasamalai and Natampalli felling series on either side of the Ulchekkadi valley. Extraction at present takes place along a very rough cart-track. The length of the alignment is 9 miles and the estimate cost Rs. 3,850 of which Rs. 750 is required for the acquisition of the land. Of the 9 miles, approximately 5 miles pass through patta lands, 2½ through poramboke and the remaining 1½ through the Chinniyampettai panchayat reserve. A large number of villages would be served by the road and as it will chiefly benefit the public, its construction is proposed provided the district board is willing to contribute four-fifths of the cost, the remaining one-fifth, or Rs. 770, to be met by the department.

398. *Existing buildings.*—All existing buildings will be kept in a state of repair and their surroundings kept clear of undergrowth as an anti-malarial measure (vide C.C.P.L. Dis. No. 615/29, dated 9th August 1929). It is necessary that the supply of furniture in rest houses and inspection sheds should be standardized, the principle being to provide for two officers in two-room buildings and for one when there is a single room. If funds permit, this should be done within a period of three years.

399. *Proposed buildings.*—The construction of the following buildings is prescribed:—

(i) *Out-houses for the Mandaparai rest-house (Polur range).*—These will include a kitchen, a room for servants and a motor shed. All three can be constructed in one block. Mud walls and a thatched roof will suffice. The cost should not exceed Rs. 250.

(ii) *Quarters for two guards at Patrakad (Polur range).*—At present the forester at Patrakad is provided with quarters, but the guards are obliged to live in the village under difficult and insanitary conditions. The approximate cost will be Rs. 1,200.

(iii) *Quarters for two range clerks and one forest guard at Santavasal (Santavasal range).*—It is very difficult to obtain quarters in the town. At present the senior range clerk is living, under protest, in the old rest house, which is a thatched building and unsuitable for permanent occupation, owing to risk from fire. The building is, however, suitable for occupation as a rest house by subordinate touring officers. It is therefore proposed that it be handed over to the District Board after the quarters for the range clerk have been constructed. The approximate cost of the prescribed buildings will be—

	RS.
Quarters for two range clerks, in one block, each half being semi-detached	2,000
Quarters for one forest guard	500

400. *Wells.*—Existing wells should be cleaned annually; and deepened and repaired as required from time to time. The tube well at Mandaparai requires immediate attention and it is essential that it should be put into working order as soon as possible for the only other source of supply in the locality is a filthy well situated in an insanitary village three or four furlongs from the rest-house.

SECTION 4.—MISCELLANEOUS PRESCRIPTIONS.

401. *Prevention of the free removal of thorns by ryots in the Vellore and Odagathur ranges.*—In C.C.P. No. 83, dated 19th March 1925, ryots were granted the concession of free removal of thorns, under departmental supervision, from reserves which have since passed into panchayat control. When the tentative scheme of working for the Odagathur range, now divided into the Vellore and Odagathur ranges, was drawn up in 1925, the concession was given effect to, but the two very important conditions governing it were omitted. The result is that, even after the transfer to Panchayat management of those reserves to which the concession applied, unrestricted removals still continue in departmental reserves. An erroneous prescription has thus become a passport into the reserve for anybody with a cutting implement who cares to enter, and along with the removal of thorns there has been a great deal of illicit cutting of thornless species. The practice should cease and wide publicity be given to the fact that such removals are irregular, and that anydody found cutting or removing thorns, or even entering the reserves, with or without a cutting implement, will be treated as a forest offender.

402. *Eradication of lantana.*—Lantana occurs in the following localities and covers an area of approximately 1,220 acres :—

Range.	Locality.	Approximate Area.
Vellore	Around and near Yerikollai enclosure in the Arasampet reserve.	260
Odagathur	At the junction of the Vellakal Pallam (stream) with the northern boundary of the Vellakal reserve.	240
Santavasal	Around Periyakottan Setty enclosure in the Arasampet reserve.	80
	In the Santavasal fuel felling series.	40
Polur	Along the district boundary about a mile east of the Gillman road.	60
	Around Palvedi enclosure near the western boundary of Patrakad reserve.	100
	On either side of Selangu Ar (stream) about a mile south-west of Pattan Koil enclosure in the Patrakad reserve.	80
Tiruvannamalai	On the banks of the Ponniar river in the Ponniar reserve.	360

Cutting and uprooting will be done during June and July, when the ground becomes soft enough, and the debris burned in heaps as soon as possible after. The annual expenditure will be limited to Rs. 100. The localities to be dealt with each year are left to the discretion of the District Forest Officer as they will depend on the availability of labour from time to time. The approximate limits in each locality have been marked on the Sandal Working Maps.

403. *Spraying* may however be adpoted as an alternative should, in the light of future experience elsewhere, it be found effective at a cost lower than that for cutting, uprooting and burning.

SECTION 5.—BOUNDARIES.

404. *Reserve boundaries.*—The clearing and maintenance of all reserve boundaries will be done by the local subordinates and no extra expenditure should be incurred under this head.

405. *Enclosure boundaries.*—Mention has been made in paragraph 29 above of the confused state of the boundaries of enclosures on the Javadi hills. The special officer who was recently posted to the division to investigate and set matters right has since completed his work. The Working Maps issued with this plan should be corrected as required in accordance with the result of his investigation and new lines cleared in the forest where necessary.

SECTION 6.—CONTROL.

406. *General.*—The correct and regular posting of control records and maps is most important and must receive the personal attention of the District Forest Officer. The controls prescribed in the following paragraphs will be maintained as laid down for each

working circle separately or for the working plan area as a whole. The forms to be used are given in Apprndix VIII and the required number of printed blank forms, with the prescriptions for the working plan period written up, where feasible, by the Working Plans Officer, are being supplied to the District Forest Officer with a copy of the Working Plan.

407. *Sandal Working Circle—*

(i) *Control of fellings, Form VIII.*—A separate form will be used for each felling series and also for the enclosures situated in each range. Columns 1 to 3 have been written up in the blank forms for the whole working plan period. The District Forest Officer will write up column 4 and, if there is a deviation, quote the authority in column 5 when sanction is received. Sample entries are given in the form in Appendix VIII.

(ii) *Record of yield, Form VIII (a).*—* All columns will be written up by the District Forest Officer. Sample entries for 1936–37 and 1937–38 are given in columns 1 to 4 of the form in Appendix VIII.

(iii) *Felling Series Journal, Form IX.*—All columns will be written up by the District Forest Officer. A separate form will be used for each felling series or the enclosures of each range. Sample entries and posting instructions are given in the form in Appendix VIII.

408. As no regeneration operations are prescribed, no control of regeneration is necessary. As enumeration and tending automatically precede extraction it will suffice if these items are recorded in the Record of Works [paragraph 414 (i) below].

409. *Fuel and Small Timber Working Circle—*

(i) *Control of fellings, Form XI.*—A separate form will be used for each felling series. Columns 1 and 2 have been written up in the blank forms for the whole working plan period. The District Forest Officer will write up columns 3 to 6 as each coupe is worked and will record in column 6 the reason for any area remaining unworked, and deviations if any, quoting the authority in each case.

(ii) *Record of yield, Form XI (a).*—* The form merely records yields from areas actually worked. A separate form will be used for each felling series. Columns 2 and 3 will show such areas and the whole form will be filled in by the District Forest Officer. Deviations are dealt with in Form XI and will not appear in column 5 of this form. In order to complete the form every contractor shall be required to furnish by the 15th of each month a statement showing the number of stacks of firewood [the dimensions of which will have been fixed by the District Forest Officer—Vide paragraph 299 (ii) above] and the number of cubic feet of small timber removed from his coupe in the previous month.

(iii) *Control of rab regeneration, Form XII.*—The present rab regeneration ledger, showing much detail of the number and height of surviving seedlings at various periods, is of no help. It means little to know that so many thousand seedlings of so many inches survived at given periods. Form XII will indicate what has been done and the results achieved will be recorded in the form of brief narrative notes in the Control Journal [paragraph 414 (ii) below]. A separate form will be used for each felling series and will be written up by the District Forest Officer.

(iv) *Recording worked areas on fuel working maps.*—The coupes, or parts thereof, felled each year will be recorded on the fuel working maps in the red waterproof ink by parallel horizontal lines about 1/16 of an inch apart. This will be done on both the range and district maps. The area in acres need not be marked in as this would overcrowd the map with unnecessary details.

410. *Bamboo Working Circle—*

(i) *Control of fellings, Form XIII.*—A separate form will be used for each felling series. The District Forest Officer will write up columns 2 to 4 as each coupe is worked and if there is a deviation quote the authority in column 5 when sanction is received.

(ii) *Record of yield, Form XIII (a).*—* The form merely records yields from areas actually worked. A separate form will be used for each felling series. Columns 2 and 3 will show the areas worked and the whole form will be filled in by the District Forest Officer. Deviations are dealt with in Form XIII and will not appear in column 5 of this form. In order to complete the form every contractor shall be required to furnish by the 15th of each month a statement showing the quantities of bamboo, *Bambusa arundinacea* and *Dendrocalamus strictus* separately, removed by him in the previous month. The denominations of quantities, i.e., cart-loads, head-loads or culms, should be clearly recorded.

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* This form is not strictly a control form as no outturn check is prescribed. But it is necessary to record an abstract of yields and desirable to compare it with the working plan estimate. To record the yield in the control form would make it too cumbersome.

411. *Minor Forest Produce Working Circle—*

(i) *Control of Working, Form XIV.*—Columns 1 and 2 have been written up in the blank forms as shown in Appendix VIII. The District Forest Officer will record the year in column 3 as each sale unit (range, quarry or farm) is sold and, if there is a deviation, quote the authority in column 4 when sanction is received. A separate form need not be used for each year ; sufficient space has been left against each sale unit in the blank forms for use during the working plan period.

When any particular product, for which a special demand may have arisen, is singled out and sold separately, a brief note should be recorded in column 4.

(ii) *Record of yield, Form XIV (a).*— * The form merely records the quantities of the various products collected in each range every year. Products have been grouped together under maunds, measures, cart-loads and pounds. This is in accordance with the custom prevailing in the local markets. Columns 1 and 2 have been written up in the blank forms, as shown in Appendix VIII, for the working plan period, and the District Forest Officer will fill in the other columns each year. Every contractor shall be required to furnish by the 15th of each month a statement showing the quantity of each product removed by him in the previous month.

412. *Green Leaf Manure Working Circle—*

(i) *Record of yield, Form XV (a).*—* The form merely records the number of cart-loads of green leaves removed annually from each range. Columns 1 and 2 have been written up in the blank forms, as shown in Appendix VIII, for the working plan period. The District Forest Officer will fill in the other columns each year.

413. *Grazing Working Circle—*

(i) *Control of grazing, Form XVI.*—The two prescriptions which require control are closure of certain areas and the continuance of concessions. These are provided for in Control Form XVI. The whole form will be written up by the District Forest Officer each year. Sample entries are given in the form in Appendix VIII. Deviations if any, with authority, should be recorded in column 6.

414. *The whole Working Plan Area—*

(i) *Record of Works* will be maintained in one loose leaf file. Separate sheets will be allotted for each year and for each working circle and for miscellaneous, but not for each Felling Series. It will not repeat information already given in the foregoing control forms. "Measures prescribed," "suggested" and "done but not prescribed or suggested" will each have a sheet of its own under each working circle and miscellaneous. The form to be used is given in Appendix VIII. Columns 1 and 2 have been written up in the blank forms, for the working plan period, and the District Forest Officer will complete columns 3 to 7.

(ii) *Control Journal* will also be maintained in a loose leaf file and will give a detailed account of the operations of the working plan. The Journal is intended to give the District Forest Officer an opportunity for recording suggestions for modification and improvement in the methods of working, which have been prescribed ; and if properly maintained should be of great help at the next revision of the working plan. Separate pages will be allotted for each Working Circle, Miscellaneous, Establishment and Labour, and Financial Results. Notes should be brief and of interest ; needless and useless remarks should be avoided. The headings noted in Appendix VIII are suggested as a guide.

(iii) *Deviation Statement* will be written up in the form perscribed in Appendix VIII and maintained in a separate loose leaf register. A spare copy of the deviation statement will accompany the Control Returns sent by District Forest Officer through the Territorial Conservator to the Working Plans Conservator. The Territorial Conservator will record any remarks he has to make on the deviation statement and the Working Plans Conservator will submit the statement with his remarks and recommendations to the Chief Conservator of Forests, who will communicate copies of his orders on it to all three officers.

On receipt of Chief Conservator's orders, the District Forest Officer will quote Chief Conservator's order in the remarks column of control forms against deviation items hitherto pending sanction.

Only serious deviations need the Chief Conservator's prior sanction. Minor ones will have already been sanctioned by Conservator, or will be sanctioned on the deviation statement. A good deal of correspondence will thus be avoided.

(iv) *Fire map.*—A fire map for the whole district, on a scale of 1 inch to a mile, will be maintained in the District Forest Office. Burnt areas will be marked in as soon as fire occurrence reports are received from Range officers, a different symbol or colour being used for each year.

*** This form is not strictly a control form as no outturn check is prescribed. But it is necessary to record an abstract of yields and desirable to compare it with the working plan estimate. To record the yield in the control form would make it too cumbersome.**

CHAPTER IX.—ESTABLISHMENT AND LABOUR.

SECTION 1.—ESTABLISHMENT.

415. *Additional establishment required.*—Owing to the natural spread of sandal it has been necessary to presciibe three new sandal felling series, namely, Alleri and Tiruvannamalai in the Vellore and Tiruvannamalai ranges respectively and Moolakad in the Polur range. No additional staff is proposed for the Alleri and Tiruvannamalai felling series as the yield of sandalwood from them is small, but in the case of the Moolakad series *one extra guard* is required. *The post* will be a *permanent* one and the incumbent posted as the District Forest Officer deems necessary.

416. *Temporary posts in the newly constituted Vellore range.*—Consequent to the division of the Odagathur range into two separate units, it is proposed that the following temporary posts in the newly constituted Vellore range be made permanent :—

One range officer newly appointed.

One range clerk and one range peon, transferred from the old Odagathur range.

SECTION 2.—LABOUR.

417. No prescriptions are necessary but every endeavour should be made to see that the Forest Village system on the Javadi hills works satisfactorily. Prompt payment of fire rewards and wages for work done will go a long way towards securing this.

CHAPTER X.—FINANCIAL FORECAST AND COST OF THE WORKING PLAN.

418. *Financial forecast.*—Statements are given below showing the estimated revenue and expenditure for the period of this working plan. From the statement at paragraph 226 above it is seen that bamboos contribute 30 per cent of the revenue of the division. In view of the present flowering, howevei, it is possible that there may be a considerable reduction in the estimated revenue under this head. The revenue derived from sandal is variable and depends on a fluctuating demand. The estimate for revenue is therefore tentative and liable to alteration from year to year. Reserve fuel felling series have not been taken into account in framing the estimate.

Estimate of annual revenue and expenditure for the ten-year period 1936–37 *to* 1945–46.

Working circle or area. (1)	Revenue. By sale of (2)	Revenue. Rate. (3) RS.	Revenue. Amount. (4) RS.	Revenue. Paragraph references and remarks. (5)	Expenditure. Particulars. (6)	Expenditure. Rate. (7) RS.	Expenditure. Amount. (8) RS.	Expenditure. Paragraph references and remarks. (9)
					Conservancy and Works.			
Sandal Working Circle.	500 tons *Sandalwood.	800 per ton.	4,00,000	*Paragraph 253. The rate has been estimated with reference to the prices obtained during the last three years.	Original clearing, 124·6 miles of coupe boundary.	6 per mile.	748	Paragraph 255. The expenditure will be only for the first five years of the working plan period.
					Reclearing 111·8 miles of coupe boundary ..	3 per mile.	335	Paragraph 255. The expenditure will be for the sixth to the tenth years.
					Marking and enumerating dead trees for extraction over 89,694 acres.*	Quarteranna per acre.	1,401	*Sum of figures in column 21 of statement at paragraph 259.
					Extraction, rough cleaning and transport to the sale depot at Tiruppattur, including reweighing and final cleaning:—			
					Vellore range .. 12·4 tons ..	70 per ton.	868	For calculation of yield see paragraph 253 and for rates paragraph 109.
					Santavasal „ .. 201·1 „ ..	60 „	12,066	
					Polur „ .. 278·2 „ ..	45 „	12,519	
					Tiruvannamalai „ .. 5·1 „ ..	80 „	408	
Fuel and Small Timber Working Circle.	12,290 acres * in 20 felling series.	18 per acre.	2,21,220	*Sum of areas in columns 4 to 13 of statement at paragraph 280.	Providing and erecting coupe stones with number of coupe and year of felling engraved on each. It is anticipated that about 600 coupe stones will be required for 200 coupes.	3 per stone.	1,800	Paragraph 326.
				The average rate for the last twelve years working is Rs. 13/3 per acre. As poorer areas have now been excluded, a rate of Rs. 18 per acre has been adopted.	Artificial regeneration by rab sowings, in lines, over 12,290 acres, including cost of seed collection, burning debris, soil preparation and sowing and soil aeration.	6 annas per acre.	4,609	Paragraph 301 to 313. Reliable date relating to the cost of this work are not available. The rate provided is considered reasonable in view of the fact that cutting and heaping of debris is done by coupe contractors.
Bamboo Working Circle.	189,770 acres in 34 felling series. Worked on a three-year rotation.	..	5,93,910	As no reliable data are available for calculating the future yield, the estimate is based on the average annual amount realized during the last three years—paragraph 226. It must however be emphasized that the flowering of bamboo may make a considerable difference to the amount estimated.	Nil.	..	..	....
Minor Forest Produce and Green Leaf Manure working circles.	Minor forest produce throughout the division and green leaf for manure from 12 blocks aggregating 17,580 acres.	..	3,17,600	Based on the average annual amount realized during the last three years—paragraph 226.	Nil.	..	..	....

Estimate of annual revenue and expenditure for the ten-year period 1936–37 to 1945–46—cont.

Revenue.

Working Circle or area. (1)	By sale of (2)	Rate. (3)	Amount. (4)	Paragraph references and remarks. (5)
			RS.	
Grazing working circle.	Grazing permits ..	..	2,60,710	Based on the average annual amount realized during the last three years—paragraph 226.
The whole division.	Miscellaneous items— Timber and fuel from unreserves, fines, forfeitures, land leases, etc.	..	1,75,590	Do.
	Total revenue ..	..	**19,69,030**	

Expenditure.

Particulars. (6)	Rate. (7)	Amount. (8)	Paragraph references and remarks. (9)
	RS.	RS.	
Improvement of watering facilities	..	2,780	Paragraph 380. The expenditure will continue for five years only.
Fire protection—			
Payment of fire rewards	..	10,750	Paragraphs 388 to 390.
Fire tracing 220 miles of important roads, cart-tracks and foot-paths.	2 per mile.	440	Paragraph 392.
Experiments	Lump sum.	100	Paragraph 393.
Communications and buildings—			
Maintenance of existing roads	..	26,620	Estimate based on figures furnished in column (5) of statement at paragraph 219.
Do. existing buildings	..	13,870	Estimate based on figures furnished in column (5) of statement at paragraph 220.
Do. existing wells	Lump sum.	1,000	The figures noted in column (5) of the statement at paragraph 221 shows an annual maintenance figure of Rs. 87/4. As some of the wells have not been cleaned regularly in the past, this figure has been increased to Rs. 100.
Construction of new roads—			
Nadanur-Mandaparai, six miles five furlongs.	..	12,550	Paragraph 396.
Tanipadi-Ulchekkadi, nine miles	..	770	Paragraph 397.
Construction of new buildings—			
Outhouses for Mandaparai rest house ..	..	250	Paragraph 399.
Quarters for two forest guards at Patrakad.	..	1,200	Paragraph 399.
Quarters for two range clerks at Santavasal.	..	2,000	Paragraph 399.
Quarters for one forest guard at Santavasal.	..	500	Paragraph 399.
Eradication of lantana	..	1,000	Paragraph 402.
Establishment.			
Existing strength	..	6,45,250	Average for last three years. Paragraph 226.
Additional guard proposed for sandalwood extraction in the Moolakad felling series.	..	1,988	Paragraph 415. The scale of pay has been fixed at Rs. 16/9 a month (Working Plans Conservator's No. A, 1171/35, dated 11th October 1935.)
Miscellaneous items.			
Repairs and renewals of stores, tools, etc., honoraria and contingencies, excluding pay of menials.	..	57,480	Average for last three years. Paragraph 226.
Total expenditure ..	..	**8,13,302**	

ABSTRACT.

	RS.
Estimated revenue for ten-year period, 1936–37 to 1945–46	19,69,030
Estimated expenditure for ten-year period, 1936–37 to 1945–46	8,13,302
Estimated profit for ten-year period, 1936–37 to 1945–46	11,55,728
Estimated annual profit	1,15,573

or Rs. 247–8–0 per square mile of reserved forest.
or Re 0–6–2 per acre.

419. *Cost of the Working Plan.*—The cost of the working plan is Rs. 73,849–11–3. Assuming that this amount, together with compound interest at 3 per cent, is liquidated during the ten-year period to which the plan applies, the annual charge debitable to revenue would be Rs. 8,658 or 5·6 pies per acre. Actually, however, the utility of the plan should not cease after ten years as re-stockmapping of sandal, fuel and bamboo areas will not be necessary at the next revision, which will probably be concerned with minor alterations in the prescriptions and, perhaps, small readjustments of area. Details relating to the total cost are given in the following statement.

Particulars.	Amount. RS.	A.	P.
Pay of officers Voted	28,837	14	0
Pay of establishment Voted	22,987	11	0
Travelling allowance Voted	12,334	7	0
Fixed travelling allowance Voted	2,197	0	0
Other compensatory allowances Voted (local and conveyance)	530	0	0
Contingencies	1,472	5	9
Field work	5,490	5	6
Total	73,849	11	3

SUMMARY OF PRESCRIPTIONS.

Sandal Working Circle.

		Number of paragraph in working plan.
1	*Silvicultural system.*—A modification of the selection system consisting of the removal of dead trees only and of the maintenance and improvement of the growing stock by rigid protection and tending operations	246 to 248
2	*Felling series.*—Nine	249
3	*Felling cycle.*—Six years	251
4	*Allocation of coupes.*—Each felling series divided into six coupes ; positions shown on sandal working map	252
5	*Yield.*—Santavasal and Polur ranges 47·93 TONS; Vellore range 1·24; Tiruvannamalai range 0·51; total 49·68 or 50	253
6	*Regulation of operations.*—One coupe in each felling series and a definite area of sandal bearing enclosures to be exploited annually	254
7	*Clearing, and reclearing after the first felling cycle, coupe boundaries*—Lines 10 feet wide to be cleared where coupe boundaries do not correspond with natural or permanent artificial features. Clearing and reclearing to be done in the year preceding felling	255
8	*Exploitation.*—Extraction confined to dead trees, both standing and fallen, including all stumps and roots. All green fallen or broken stems and branches also to be removed	256
9	*Minimum exploitable size.*—Trees containing no heartwood not to be dispatched to sale depots and no root containing heartwood of more than the size of half a rupee to be left on the ground	257
10	*Restriction of output.*—None imposed as exploitation to be regulated by area	258
11	*Size of coupe* — Vide tabular statement of felling.	259, 260
12	*Area of enclosure to be exploited annually* — Vide tabular statement of felling.	
13	*Tending.*—No general tending prescribed. Creepers to be cut during marking for extraction	261, 262
14	*Artificial regeneration.*—None prescribed	263
15	*Fire protection.*—Included in that of the division as a whole. In addition, flowered bamboo areas, where sandal occurs, and where there is risk from fire, to be protected by a 30 feet wide line all round, costing Rs. 15 a mile. Rs. 1,000 to be asked for every year until fire risk disappears and surrendered, either in whole or in part, as soon as it becomes known what amount is actually required	264 to 266
16	*Measures for the prevention of the spread of spike disease.*—Definite rules prescribed and to be revised from time to time in consultation with the Provincial Silviculturist	267, 268

	Number of paragraph in working plan.
17 *Retail sales.*—Billets 6 to 12 inches in girth and 6 to 12 inches in length and limited to 5 lb. each in weight, to be distributed among Range Officers as follows :—	

	Billets.
Vellore	200
Odagathur	100
Santavasal	100
Polur	100
Tiruvannamalai	250

Minimum stock with any Range Officer 25 billets .. .. 269 to 273

Fuel and Small Timber Working Circle.

1 *Silvicultural system.*—Simple coppice with reservation of sandal, minor forest produce and bark yielding trees	276
2 *Felling series.*—Twenty four, twenty 'Regular' and four 'Reserve'	277
3 *Rotation.*—Forty years	278
4 *Size and allocation of coupes.*—Only ten coupes in each regular felling series allocated. Area shown in statement at paragraph 280 and positions on fuel working maps	279
5 *Calculation of yield.*—Based on actuals of last twelve years working ..	280
6 *Regulation of operations.*—One coupe in each of the regular felling series and one in each of the reserve series, if there is a demand, to be felled annually..	281
7 *Laying out and demarcation of coupes.*—Coupes to be surveyed and demarcated by lines 6 feet wide by the end of November in the year preceding felling ..	282
8 *Cost of demarcation.*—Fuel resulting from clearing coupe lines to be handed over to the contractor, who purchases the coupe, after recovering the cost of clearing from him	283
9 *Agency of felling.*—Contractors, coupes to be sold in auction each year three months in advance of the year of felling	284
10 *Period of lease.*—1st January to 31st March for cutting manure leaf, 1st April to end of February for felling and 1st April to 31st March for removals ..	285
11 *Area remaining unfelled on the termination of a lease.*—The unfelled portion of a coupe, unless it contains poor growth, to be leased to the contractor to whom the adjoining coupe has been sold, and to him only. Should he refuse, the area to be left unworked	286
12 *Division of coupe into strips and control of fellings.*—Immediately after sale, coupes to be divided into a convenient number of strips, 20 to 25 acres in extent, by natural features or cleared lines 6 feet wide. Clearing to be done by coupe contractors and work not to commence until this has been completed. Felling to proceed strip by strip	287
13 *Green leaf manure.*—Coupes to be sold three months in advance of the year of felling and contractors permitted to cut and supply manure leaf therefrom.	288
14 *Cutting thorny growth at time of felling.*—Sufficient debris to be cut to provide a fence, 4 feet by 4 feet all round the coupe, and the required number of rab heaps	289 to 296
15 *Useless tree species.*—Not to be felled unless occurring on or near a rab line or interfering with coppice of fuel species	297
16 *Felling rules.*—Five rules prescribed	298
17 *Disposal of felled material.*—Small timber to be hammer-marked by the coupe forest guard and fuel to be stacked before removal. Size of stacks to be fixed by the District Forest Officer in consultation with contractors. Cutting and removal of twigs and thorns by purchasers and consumers under head-load chits issued by contractors not to be permitted	299
18 *Artificial regeneration.*—Rab sowings in patches 9 feet wide	301
19 *Heaping debris.*—To be done by coupe contractors wherever possible ..	302
20 *Height of heaps.*—3 feet well compacted	303, 304
21 *Burning.*—As short a period as possible to lapse between burning and sowing..	305
22 *Soil preparation and sowing.*—Seed will be dibbled lightly in three lines along the centre of each rab patch. Soil to be worked to a width of 12 inches and to a depth of 6 inches along each line	306
23 *Choice of species.*—A mixture of two or three species in each patch. Mixture to be varied as much as possible. Selection of species left to the District Forest Officer	307

		Number of paragraph in working plan.
24	*Collection of seed.*— Progress to be carefully watched by the District Forest Officer Collection to be done by subordinates or under their personal supervision	308
25	*Date of sowing.*—Half the area during the middle of September in the year of felling and the other half during the last week of the following April.. ..	309 to 311
26	*Weeding and tending.*—By beat subordinates	312
27	*Soil aeration.*— In September and again in January	313
28	*Supply of small timber to ryots.*—Provision to be made by contractors—Suitable clause to be inserted in coupe agreements	314
29	*Disposal of palmyra-palms in two plantation felling series.*—To be included as part of the fuel crop and felling to be left to the wish of coupe contractors..	315 to 318
30	*Indicator areas.*—Not prescribed	319
31	*Closure to grazing.*—Seven years, including the year of felling. Grass cutting in particular areas may be permitted with the specific sanction of the Conservator	320
32	*Thorn fence round closed areas.*— As it is felled, each coupe to be fenced on all sides by thorn fence 4 feet by 4 feet	321 to 325
33	*Coupe stones.*—One to be planted at each of the four salient corners of a coupe. Number of coupe and year of felling to be engraved on each stone..	326

Bamboo Working Circle.

1	*Felling cycle*—Three years	335
2	*The intensity of felling in a clump.*—Current years culms not to be felled and a minimum of four mature culms to be left in each clump	336
3	*The height at which culms should be felled.*—Two to three feet from the ground ..	337
4	*Subdivision of the area.*—Thirty-four felling series of three coupes each ..	340
5	*Regulation of fellings.*—Generally through contractors, one coupe in each felling series to be worked annually. Departmental working, if expedient, left to the discretion of the District Forest Officer	341
6	*Period of lease.*—District Forest Officer to decide whether annual or triennial leases should be adopted. Conservator to be consulted	342
7	*Hacking of Dendrocalamus strictus.*—Severe punitive action to be taken against the Malayalis by cancelling, either in whole or in part, the concession of free grazing in blocks where damage is bad. It is also suggested that graziers be prohibited from carrying bill hooks	344
8	*Overworking by contractors.*—Imposition of heavy-fines suggested	345
9	*The construction of new roads and extraction cart-tracks.*—Contractors to obtain the District Forest Officer's approval before constructing a new cart-track. Range Officers to be instructed to align suitable traces for contractors, if necessary, free. See also Miscellaneous Regulations	346, 347
10	*Experimental felling series.*—One series of 405 acres prescribed	348, 349
11	*Grazing.*—No restriction imposed	350
12	*Fire protection.*—Included in the general scheme of protection for the division—See Miscellaneous Regulations	351, 352

Minor Forest Produce Working Circle.

1	*Subdivision of the area.*—Collection of barks and nuxvomica by ranges, quarries to be leased separately or in groups and other produce by farms. Sixteen farms prescribed. Banavaram reserve and the Palar river plantations to constitute separate sale units	354, 355
2	*Konnai (Cassia fistula) bark.*—To be worked on a five-year rotation. Lease period limited to one year from 1st July in the year of sale	356
3	*Avaram (Cassia auriculata) bark, Sural (Ventilago madraspatana) bark and nuxvomica.*—To be sold in auction in June each year. Lease period 1st July in the year of sale to 30th June following. Biennial or triennial leases may be adopted if District Forest Officer considers desirable	357
4	*Quarries.*—To be leased separately or two or more together. Lease period left to the District Forest Officer, but not to exceed three years. Lease to begin on 1st July in year of sale	358

		Number of paragraph in working plan.
5	*Other produce.*—To be leased annually. Lease period 1st July in year of sale to 30th June following. Farms to be sold separately or two or more clubbed together. Products having a special demand may be sold separately. Nux-vomica included except in Tiruvannamalai range	359
6	*Departmental working.*—May be resorted to when necessary or expedient with the prior sanction of the Conservator	360

Green Leaf Manure Working Circle.

1	*Constitution.*—Working Circle composed of twelve blocks aggregating 17,580 acres	363
2	*System.*—Removals by permits issued at Re. 1–4–0 per cart load for the Vellore and Odagathur ranges and Rs. 2 for the Santavasal, Polur and Tiruvannamalai ranges	365
3	*Rules regulating cutting and removal.*—Five rules prescribed	366

Grazing Working Circle.

1	*Constitution.*—All reserves excluding Banavaram and the Palar river plantations	367
2	*Prescriptions.*—Grazing year 1st July to 30th June. Goat browsing prohibited and worked coupes to be closed to grazing for seven years, including the year of felling	370
3	*Areas where no grazing concessions exist.*—Grazing under permits subject to usual conditions and at rates sanctioned by Government from time to time. Permits valid for one season and to be issued by officer not below rank of forester	371, 372
4	*Grazing concessions.*— i. Free grazing under 'Forest Village System' by Malayalees of the Javadi hills in the Santavasal and Polur ranges and of that part of the Thellai reserve situated in the Vellore (old Odagathur) range ii. Grazing on payment of half usual fees by Malayalees of Attiyur and Arasampet reserves of the Vellore range	373
5	*Grazing blocks under the 'Forest Village System'.*—152 prescribed	375
6	*Refund of grazing fees under the 'Forest Village System.'*—To be made early in October each year	376
7	*Thellai reserve.*—Forest Village System to continue	377
8	*Closure of burnt areas.*—When a burnt area is extensive and damage serious enough, District Forest Officer to apply to Collector for closure of area to grazing for adequate period. Collector to send copy of his order to Chief Conservator for concurrence	379
9	*Improvement of watering facilities.*—Definite programme for five years drawn up	380
10	*Cutting and removal of grass from the reserved forests.*—Cutting and removal of grass from reserved forests for bona fide domestic use is permitted under specific conditions	381
11	*Recommendation No. IV of the Agricultural Commission, Fodder supply from forest areas.*—Annual leases for the removal of hay by the Military Grass Farms to be continued. Period of lease 1st July to 15th March	382
12	*Demarcation of closed areas.*—Closed areas to be indicated by red sign boards ..	383

Miscellaneous Regulations.

1	*Fire protection.*—Special protection to be undertaken in 88,565 acres in the Santavasal, Polur and Vellore ranges and in 18,900 acres in the Tiruvannamalai range	386
2	*Fire lines.*—16½ miles of reserve boundary on the Kalroyan hills to be maintained as fire lines	387
3	*Fire rewards.*—Rate fixed at Re. 1 per 100 acres	388
4	*Fines for bad protection.*—To be worked out by special formula and the balance payable disbursed early in October	389
5	*Payment of rewards.*—Rewards to be paid early in October	390
6	*General protection.*—To be undertaken in all areas where special protection is not carried out	391
7	*Fire tracing important roads, cart-tracks and foot paths.*—21¾ miles to be fire traced at Rs. 2 per mile	392

		Number of paragraph in working plan.
8	*Red sanders* (*Pterocarpus santalinus*) *increment plot.*—To be laid out in consultation with Provincial Silviculturist. Twenty trees of each 6 inch girth class to be represented. Girth measurements to be recorded in February each year to the nearest half inch.	393
9	*Existing roads.*—To be maintained	394
10	*Proposed roads.*—	
	i. Nadanur-Mandaparai road, Rs. 12,550	396
	ii. Tanipadi-Ulchekkadi road, Rs. 770	397
11	*Existing buildings.*—To be maintained, and the supply of furniture in rest houses, standardized within a period of three years	398
12	*Proposed buildings.*—	
	i. Outhouses for Mandaparai rest house, Rs. 250	399
	ii. Quarters for two forest guards at Patrakad, Rs. 1,200	
	iii. Quarters for two range clerks at Santavasal, Rs. 2,000	
	iv. Quarters for one forest guard at Santavasal, Rs. 500	
13	*Wells.*—Existing wells to be cleaned annually, deepened and repaired as required. Tube well at Mandaparai to be put into working order as soon as possible	400
14	*Prevention of the free removal of thorns by ryots in Vellore and Odagathur ranges.*—Practice to cease and publicity given to the fact that such removals are irregular	401
15	*Eradication of lantana.*—Total area 1,220 acres. Annual expenditure limited to Rs. 100	402
16	*Spraying lantana.*—To be adopted if found effective at a cost lower than that for cutting, uprooting and burning	403
17	*Reserve boundaries.*—To be maintained by subordinates	404
18	*Enclosure boundaries.*—Working maps issued with this plan to be corrected in accordance with the result of boundary verification recently carried by special officer	405
19	*Control.*—Maintenance of control records and maps must receive the personal attention of the District Forest Officer	406
20	*Control forms, Sandal Working Circle.*—	
	i. Control of felling, Form VIII	407
	ii. Record of yield, Form VIII (*a*)	
	iii. Felling Series Journal, Form IX	
	Control forms, Fuel and Small Timber Working Circle.—	
	i. Control of felling, Form XI	409
	ii. Record of yield, Form XI (*a*)	
	iii. Control of Rab Regeneration, Form XII	
	iv. Recording worked areas on fuel working maps	
	Control forms, Bamboo Working Circle.—	
	i. Control of felling, Form XIII	410
	ii. Record of yield, Form XIII (*a*)	
	Control forms, Minor Forest Produce Working Circle.—	
	i. Control of working, Form XIV	411
	ii. Record of yield, Form XIV (*a*)	
	Control forms, Green Leaf Manure Working Circle.—	
	i. Record of yield, Form XV (*a*)	412
	Control forms, Grazing Working Circle.—	
	i. Control of grazing, Form XVI	413
	Control forms, whole Working Plan Area.—	
	i. Record of works	414
	ii. Control journal	
	iii. Deviation statement	
	iv. Fire map	

Establishment and Labour.

1	*Additional establishment required.*—One extra guard for the Moolakad sandal felling series of the Polur range. Post to be permanent and incumbent posted where District Forest Officer deems necessary	415
2	*Temporary posts in the newly constituted Vellore range.*—Proposed to make permanent the posts of—	
	i. One Range Officer	416
	ii. One Range clerk	
	iii. One Range peon	

APPENDIX I.

List of revenue taluks comprising the Vellore East Forest Division.

(Reference—Paragraph 3.)

Revenue district.	Taluks.	Area in square miles.	Remarks.
(1)	(2)	(3)	(4)
Chingleput	Chingleput	436	
	Conjeeveram	412	
	Madurantakam	530	
	Saidapet	247	
	Sriperumbudur	306	
North Arcot	Arkonam	319	
	Arni	176	
	Chengam	332	
	Cheyyar	328	
	Gudiyattam	100	Part only.
	Polur	589	
	Tiruvannamalai	375	
	Vellore	432	
	Walajapet	395	
	Wandiwash	340	
South Arcot	Gingee	410	
	Kallakuruchi	7	Pavinjipattu Reserve Forest only (4,313·88 acres).
	Tindivanam	446	
	Tirukoyilur	101	Part only.
	Villupuram	467	
	Total ..	6,748	

APPENDIX II.

Statement of monthly rainfall recorded at each rain gauge station during the period 1925 to 1934.

(Reference—Paragraph 19.)

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
NAIKANERI (ODAGATHUR RANGE).													
1925	..	..	..	..	10·88	1·60	3·80	8·28	4·00	2·60	3·60	7·84	42·60
1926	4·06	..	..	1·84	3·92	3·40	0·24	4·08	7·00	6·12	..	3·40	34·06
1927	..	..	..	..	4·12	0·40	3·90	4·80	7·90	7·90	0·90	..	29·92
1928	..	..	..	0·80	4·20	4·00	1·40	4·40	5·60	9·60	3·20	4·10	37·30
1929	1·40	..	..	4·00	3·20	3·60	5·20	1·20	3·60	5·60	7·60	1·60	37·00
1930	1·80	4·00	0·60	..	7·20	3·20	2·00	1·40	5·60	15·40	14·40	1·00	56·60
1931	..	..	..	..	4·00	1·60	7·40	1·00	10·40	3·80	6·20	10·00	44·40
1932	..	0·50	..	..	1·00	0·40	2·00	6·00	2·00	12·00	4·60	0·60	29·10
1933	..	..	1·00	3·40	8·00	..	..	3·80	4·00	4·60	..	4·40	29·20
1934	4·00	..	..	0·40	1·40	2·20	2·80	5·80	1·20	7·80	2·40	..	28·00
Total ..	**11·26**	**4·50**	**1·60**	**10·44**	**47·92**	**20·40**	**28·74**	**40·76**	**51·30**	**75·42**	**42·90**	**32·94**	**268·18**
KYLASAGIRI (ODAGATHUR RANGE).													
1925	Not recorded.												
1926	..	2·40	..	1·60	..	0·40	..	8·80	2·80	4·20	0·80	..	21·00
1927	..	..	..	..	..	2·40	3·20	0·40	13·60	..	2·40	2·00	24·00
1928	1·00	2·40	1·20	1·60	0·80	1·20	1·20	0·80	1·20	1·60	1·20	1·20	15·40
1929	1·00	0·80	..	1·40	1·20	0·80	1·20	1·40	1·20	0·80	1·60	1·20	12·60
1930	0·80	0·80	0·80	..	1·60	1·20	0·80	1·20	0·80	15·40	14·40	0·80	38·60
1931	..	..	..	0·20	..	..	1·20	..	..	0·40	9·20	6·00	17·00
1932	..	0·50	..	..	1·00	0·40	..	..	3·80	6·00	1·20	..	12·90
1933	No reading was taken as the 'B' bottle was broken.												
1934	Do.				do.								
Total ..	**2·80**	**6·90**	**2·00**	**4·80**	**4·60**	**6·40**	**7·60**	**12·60**	**23·40**	**28·40**	**30·80**	**11·20**	**141·50**
SHEMBAKATOPE (SANTAVASAL RANGE).													
1925	..	..	0·80	0·80	4·00	..	..	..	..	..	3·20	12·40	21·20
1926	12·00	..	..	..	3·60	0·40	7·20	4·00	8·80	5·20	5·20	1·60	48·00
1927	..	1·20	..	..	3·20	7·20	4·00	3·60	12·00	2·60	6·70	0·20	40·70
1928	3·20	3·50	0·40	3·40	3·60	12·00	2·00	4·00	6·40	13·20	3·60	4·80	60·10
1929	2·80	4·80	1·60	6·80	4·00	2·00	3·20	4·00	4·00	7·20	4·80	6·40	51·60
1930	2·40	5·20	2·00	1·20	12·80	3·20	0·60	3·00	3·00	21·00	12·00	5·90	72·30
1931	..	..	..	2·60	3·00	0·70	12·40	0·60	5·20	8·00	7·60	2·40	42·50
1932	..	..	..	..	2·00	2·40	..	8·00	10·40	5·60	8·40	2·40	39·20
1933	..	..	3·60	2·40	..	..	0·80	7·60	..	7·20	5·90	3·60	31·10
1934	7·60	..	..	0·80	1·20	..	1·60	4·00	4·00	12·80	4·00	..	36·00
Total ..	**28·00**	**14·70**	**8·40**	**18·00**	**37·40**	**27·90**	**31·80**	**38·80**	**53·80**	**82·80**	**61·40**	**39·70**	**442·70**

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
					AMERDI (SANTAVASAL RANGE).								
1925	..	..	3·20	1·90	5·00	3·40	1·60	4·60	3·60	6·20	7·40	10·80	47·70
1926	12·00	..	..	..	3·60	0·40	5·60	1·40	6·60	6·60	6·20	1·40	43·80
1927	..	..	..	..	3·00	3·20	2·80	1·80	14·20	8·70	9·00	1·80	44·50
1928	0·30	10·00	0·40	..	2·00	3·20	4·40	2·80	6·60	15·60	4·40	0·30	50·00
1929	10·00	..	..	6·20	4·00	3·60	1·60	0·30	3·20	7·60	7·60	3·20	47·30
1930	7·60	2·00	..	..	11·00	0·30	1·00	1·60	3·20	13·40	16·00	..	56·10
1931	..	..	..	..	..	6·00	13·00	0·80	3·20	2·00	2·60	0·60	34·20
1932	..	..	..	1·20	4·00	2·00	4·00	6·40	3·20	8·00	8·80	..	37·60
1933	..	..	3·60	0·80	1·60	..	..	6·60	12·00	6·40	..	..	31·00
1934	7·20	7·20	..	..	..	..	2·00	2·40	3·20	11·20	2·00	0·80	36·00
Total ..	**37·10**	**19·20**	**7·20**	**10·10**	**34·20**	**22·10**	**36·00**	**28·70**	**59·00**	**85·70**	**64·00**	**24·90**	**428·20**
					MOOLAKAD (POLUR RANGE).								
1925	..	..	0·60	2·60	3·60	..	2·40	5·60	6·10	7·60	11·60	3·20	43·30
1926	3·60	0·10	0·80	0·80	2·50	1·60	2·08	6·00	8·70	4·00	2·20	0·80	33·18
1927	..	..	..	1·60	3·10	3·60	0·30	4·70	10·10	1·10	5·80	0·50	30·80
1928	..	8·00	..	..	2·30	0·40	3·40	2·40	5·20	18·00	2·80	2·00	44·50
1929	0·60	..	..	2·00	2·30	4·60	..	..	6·60	2·00	2·00	8·00	28·10
1930	..	2·00	3·60	5·60	5·20	..	..	..	5·60	19·60	10·40	0·40	52·40
1931	..	..	..	..	1·80	..	7·40	0·40	2·40	0·18	12·60	5·60	30·38
1932	..	..	..	..	..	..	..	..	..	..	..	..	..
1933	..	..	..	..	..	..	..	1·70	..	14·40	0·10	4·00	20·20
1934	8·00	..	..	..	..	2·50	4·40	2·80	4·00	8·80	2·80	..	33·30
Total ..	**12·20**	**10·10**	**5·00**	**12·60**	**20·80**	**12·70**	**19·98**	**23·60**	**48·70**	**75·68**	**50·30**	**24·50**	**316·16**
					PATRAKAD (POLUR RANGE).								
1925	..	..	0·40	..	10·00	..	4·00	6·40	8·00	5·20	10·80	12·40	57·20
1926	6·80	10·00	..	0·80	3·00	..	4·00	2·80	7·80	5·90	5·60	2·50	49·20
1927	..	0·80	..	2·10	2·00	3·20	5·10	0·40	6·40	7·00	6·80	0·80	34·60
1928	..	4·00	2·00	4·00	3·00	2·80	2·00	5·20	9·00	22·20	3·20	..	57·40
1929	2·80	0·20	..	4·40	2·00	3·60	..	2·00	3·40	4·00	7·40	5·60	35·40
1930	6·00	4·20	0·40	1·20	12·80	..	..	3·10	7·20	17·20	11·20	0·80	64·10
1931	0·20	..	..	1·60	4·00	0·60	8·40	2·40	9·20	5·60	9·20	14·40	55·60
1932	..	..	..	1·60	5·60	2·00	..	13·20	..	7·20	6·80	1·20	37·60
1933	..	..	2·00	..	1·60	..	2·80	10·00	6·80	11·20	4·00	8·00	46·40
1934	..	5·20	..	..	1·40	4·40	3·60	5·40	1·40	16·40	1·60	..	39·40
Total ..	**15·80**	**24·40**	**4·80**	**15·70**	**45·40**	**16·60**	**29·90**	**50·90**	**59·20**	**101·90**	**66·60**	**45·70**	**476·90**
					KOMATTIYUR (POLUR RANGE).								
1925	..	..	..	..	12·52	3·80	..	10·20	0·40	7·80	2·10	4·20	41·02
1926	4·40	7·60	2·40	..	2·00	..	8·00	2·80	6·80	6·00	2·80	..	42·80
1927	..	..	..	..	0·50	4·20	4·00	1·60	5·80	1·20	4·90	0·70	22·90
1928	0·50	2·60	2·50	1·70	4·10	4·60	1·60	4·04	7·30	13·50	1·80	2·70	46·94
1929	0·90	..	..	2·00	2·00	4·60	2·60	4·60	7·70	4·60	7·60	3·20	39·80
1930	1·20	1·60	1·70	4·90	8·80	4·20	5·20	2·19	3·68	28·30	13·18	1·80	76·75
1931	..	..	..	1·60	3·40	3·20	8·10	3·20	7·10	8·40	9·50	5·60	50·10
1932	..	1·00	..	..	7·20	5·60	..	9·60	..	11·10	8·10	1·20	43·80
1933	..	..	2·80	1·00	2·40	0·80	..	16·80	4·00	13·20	2·00	..	43·00
1934	10·00	..	..	0·90	0·70	3·60	2·40	4·00	..	15·60	5·20	..	42·40
Total ..	**17·00**	**12·80**	**9·40**	**12·10**	**43·62**	**34·60**	**31·90**	**59·03**	**42·78**	**109·70**	**57·18**	**19·40**	**449·51**

APPENDIX III.

List of reserves transferred to Panchayat control (Reference—Paragraph 34).

Chingleput Revenue District.

Taluk.	Panchayat reserve.	Area in acres.	Date of transfer.
1 Chingleput	Anjur	1,492·43	1st April 1925.
	Appur	1,874·16	1st July 1927.
	Gudalur	2,319·15 385·00 340·54	1st April 1925.
	Hanumanthaputheri ..	570·24 93·65	Do.
	Kumili	1,205·68	Do.
	Kattankolathur	730·92	Do.
	Kayar	3,951·70 233·00	1st April 1924.
	Illalur	1,188·28	1st July 1927.
	Madayathur	1,370·28	1st April 1925.
	Mambakkam	1,887·51	29th May 1924.
	Manamathi	1,534·85	30th January 1928.
	Nemeli	1,525·55 452·53	1st April 1925.
	Oragadam	1,024·00 890·08	1st July 1928.
	Paranur	637·00	1st May 1924.
	Salur	947·72	1st July 1928.
	Sembakkam	1,669·50	8th February 1928.

Taluk.	Panchayat reserve.	Area in acres.	Date of transfer.
1 Chingleput—cont ..	Sonalur	1,365·03	1st July 1924.
	Sirukundram	1,558·25	1st April 1924.
	Tirukalikundram	2,280·63 } 281·54 }	1st July 1928.
	Tirumani	752·87	1st April 1925.
	Thirutheri	1,760·63	Do.
	Unamanjeri	1,950·22	Do.
	Vallam	1,491·00 } 141·92 }	Do.
	Vandalur	1,818·06	Do.
2 Conjeeveram ..	Perungoli	712·54	1st April 1925.
	Marundam	1,214·75	1st July 1923.
	Edamadi	1,555·00	1st July 1927.
3 Madurantakam ..	Meyyur	360·18 (Reserved land).	1st July 1923.
	Gudalur A	903·33	1st April 1925.
	Gudalur B	386·00	Do.
	Rajapalaiyam	398·95	Do.
	Koliyalam	838·88	1st April 1924.
	Kattugundalur	2,433·69	1st April 1925.
	Acharapakkam	1,016·60	Do.
	Kallabiranpuram	611·60	1st July 1924.
4 Saidapet	Maduraipakkam	451·06	1st July 1923.
	Mittanamalle	236·00	Do.
	Nanmangalam	676·18	Do.
	Perumbakkam	114·04	Do.
	Tambaram	444·58	Do.
	Kovilpadagai	771·75	1st April 1925.
	Tirumalavoyal	533·69	Do.
5 Sriperumdur ..	Meyyur	682·35	Do.
	Siruvanjur	504·36	Do.
	Kavanur	515·49 } 137·67 }	Do.
	Tandrai	828·33 } 53·46 }	Do.
	Maganium	955·20	Do.
	Mannur	533·03 } 402·50 }	Do.

North Arcot Revenue District.

1 Arkonam	Uriyur	622·00	9th April 1918.
	Kolathur A and B ..	1,729·00	6th April 1918.
	Ammanur	207·00	19th August 1926.
	Arkonam plantation ..	58·00	10th August 1926.
	Ammur	5,139·00	1st July 1923.
	Senneleri	2,234·00	31st January 1924.
	Punganur	13,497·00	10th and 14th July 1926.
2 Chengam	Eraiyurmalai	5,559·00	1917–18.
	Kavuthimalai	6,983·00	1st August 1928.
	Mannumangalam B Block	520·00	13th February 1927.
	Chinniyambatti	2,276·00	1917–18.
	Poovalai	3,061·00	Do.
	Radhapuram	6,428·00	1st August 1928.
	Uchimalai	1,642·00	1917–18.
	Pinjur A Block	2,488 00	1st July 1925.
	Pinjur B Block	1,876 00	1st July 1923.
	Pinjur C Block	836·00	1917–18.
	Melchengam	1,542·00	Do.
	Mennurmangalam A Block.	2,178·00	13th February 1927.
	Royanandapuram ..	4,434·00	1917–18.
3 Cheyyar	Enadavadi	1,579·00	7th December 1914.
	Thandappanthangal ..	813·00	17th April 1918.
	Thandappanthangal Extension.	310·00	Do.
4 Polur	Kelur	2,963·00	1st March 1926.
	Alliyalamangalam ..	7,520·00	1st July 1926.
	Pavathamalai	5,779·00	27th November 1926.
	Vellimalai	2,003·00	1st July 1923.
	Damarakadu	6,134·00	13th May 1927.

Taluk.	Panchayat reserve.	Area in acres.	Date of transfer.
5 Tiruvannamalai ..	Annamalai ..	1,727·00	9th May 1927.
	Thippakadu	4,280·00	1st August 1928.
	Kannamnadi	5,786·00	Do.
	Sorakolathur	5,699·00	1st July 1923.
	Poolanjimalai	584·00	1st July 1926.
	Athipakkam	1,667·00	1st July 1923.
	Thatchampattu part	1,236·00	Do.
6 Vellore	Palamadi ..	8,160·00	19th July 1926.
	Kaniyambadi	5,419·00	17th and 18th January 1924.
	Pallikonda ..	3,898·00	7th July 1924.
	Paravamalai	7,078·00	1st July 1926.
7 Walajapet	Sennileri ..	223·00	10th July 1926.
	Punganur ..	13,497·00	14th July 1926.
8 Wandiwash	Badur A ..	489·00	30th April 1918.
	Nedunguniam	1,566·00	15th October 1914.
	Ponnur	1,656·00	9th October 1914.
	Vengunam ..	867·00	20th November 1914.
	Vishamangalam	820·00	17th October 1914.
9 Gudiyattam	Bommanaikapalayam	912·00	4th October 1917.
	South Arcot Revenue District.		
1 Gingee	Siruvadi ..	3,561·00	10th May 1926.
	Muttakadu	3,187·00	....
	Padipallam	3,601·00	12th May 1926.
	Pakkamalai	11,055·00	Do.
	Gengavaram	6,627·00	13th May 1926.
	Thandavasamudram	787·00	20th April 1923.
	Karai	1,697·00	13th May 1926.
	Turunjikadu } Adukkam }	1,265·00	Do.
2 Tindivanam	Kilsevur	1,200·00	13th October 1915.
	Kurampiram	600·00	12th October 1915.
	Kumalapattu	1,201·01	26th May 1920.
	Agaran	600·00	12th October 1915.
	Markam	80·00	2nd October 1915.
3 Kallakurichi ..	Kottadamalai	2,814·00	1st July 1925.
	Porasakurichi	823·00	Do.
	Pusapadi ..	1,617·00	Do.
	Melpalangur	3,260·00	Do.
	Kaduvanur	4,065·00	24th February 1926.
	Risivandiyam	3,324·00	21st February 1926.
	Sithal	1,518·00	20th February 1926.
	Tottapadi ..	1,448·00	1st January 1926.
	Avirinyur ..	2,967·00	21st February 1926.
	Magarur	1,263·00	1st January 1926.
	Ravanthanallur	1,164·00	25th February 1926.
	Kanankadu	3,575·00	24th February 1926.
	Mallapuram	1,008·00	25th February 1926.
	Alwarmalai portion	2,600·00	1st February 1926.
	Kuttakudi ..	1,295·00	1st July 1925.
	Varanjarani	874·00	Do.
4 Tirukkoyilur ..	Swamimalai	4,262·00	23rd February 1926.
	Nothanur I	4,500·00	20th February 1926.
	Nothanur II	3,800·00	12th March 1926.
	Thatchampattu part	980·00	1st July 1923.
	Athipakkam	2,834·00	Do.
	Seedevi ..	2,800·00	19th February 1926.
	Kallamedu	1,030·00	10th January 1926
	Kunjaram ..	1,200·00	13th January 1926.
	Edakkal ..	3,390·00	16th February 1926.
	Alwarmalai	6,200·00	1st February 1926
	Pandur ..	955·00	16th February 1926.
	Kuttadi ..	1,700·00	Do.
	Sirupakam ..	1,080·00	9th January 1926.
	Nayanur ..	1,639·00	29th March 1926.
	Thurinjikadu } Adukkam .. }	1,753·00	21st May 1926.
5 Villupuram	Odayanattam	1,603·00	1st July 1926.
	Melkondai ..	480·00	3rd August 1917.
Total—19 taluks.	**144** Reserves.	**325,192·13**	

APPENDIX IV.

G.O. No. 1462, *Revenue, dated* 10*th June* 1907.

(Reference—Paragraph 35.)

Forest No. 67.—The Board of Revenue submits proposals for the treatment of the occupied lands within forest reserves of the Javadi Hills in the North Arcot district and for the treatment of trees standing thereon.

2. The Government agree with the Board that the land assigned on patta, together with such land as it may be desirable to set apart for the extension of cultivation and for the exercise of communal privileges, should be retained as enclosures within the reserves. Before the boundaries are finally notified these enclosures should be inspected by the Collector or Divisional Officer to ensure that sufficient land has been allowed for the extension of cultivation and for the exercise of communal privileges and by the District Forest Officer to verify the suitability and accuracy of the boundary determined.

3. The Government do not approve of the Conservator's suggestion that the enclosures, as finally settled, should be notified by the publication of errata to the original forest settlement notifications. They consider that the enclosures should be formally disafforested. The Board will accordingly be requested to submit, in due course, a statement showing the area originally admitted and that now allowed under the heads, occupied land, unoccupied waste and poramboke in respect of each reserve, as well as the necessary disafforesting notification. The Board should also submit a sketch showing the position of all enclosures in the reserves. As observed in paragraph 6 of the Board's Reference, the issue of pattas already sanctioned by Government need not be delayed.

4. The Board's recommendations that all trees except sandal may be made over to the cultivators without collection of tree value and that the ownership of sandal trees wherever situated should be reserved to Government, are accepted. A condition should be entered in the pattas to the effect that the pattadar has no right to any sandal trees growing on the land and if possible, an agreement should be taken from the pattadar binding him to look after the trees (vide paragraph 7 of Board's Proceedings, Forest No. 14, dated 19th January 1907).

5. The Government approve of the Board's proposal to cancel ordinary as well as bilmukta pattas for trees located on land held on patta or yearly (sivoijama) tenure.

(True extract)

A. G. CARDEW,
Acting Secretary to Government.

To the Board of Revenue (Land Revenue), with one map.
Copy to the Board of Revenue (Revenue Settlement).

Resolution—Forest No. 119, *dated* 20*th June* 1907.

Communicated to the Collector of North Arcot and the Conservator of Forests, Central Circle.

2. The Collector is requested to carry out the instructions contained in the Government Order and to submit to the Board in due course the statement, draft notification and the sketch referred to in paragraph 3.

(True extract)

F. B. EVANS,
Acting Secretary.

To the Collector of North Arcot with sketch and copy of Board's Proceedings, Forest No. 14, dated 19th January 1907.
,, Conservator of Forests, Central Circle, with a copy of Board's Proceedings, Forest No. 14, dated 19th January 1907.
Copy to the Land Revenue Section.

APPENDIX V.

Agreement executed by pattadar No.

(Reference—Paragraph 35.)

son of aged profession, living in village taluk district on 1912 in consideration of the grant of patta to the said

$\frac{I}{We}$ agree that $\frac{I}{we}$ have no title, right or claim to any sandalwood tree found on $\frac{my}{our}$ land and $\frac{I}{we}$ shall protect all such trees until they are felled under orders in writing of the District Forest Officer, South Vellore, for the time being and that $\frac{I}{we}$ shall not cut, lop, break or otherwise injure them as long as they remain on $\frac{my}{our}$ land.

2. In case any sandalwood tree standing on $\frac{my}{our}$ land is illicitly removed therefrom or damaged in any way, $\frac{I}{we}$ agree to pay compensation to Government to the extent of the value of the tree or of the loss caused to Government by such cutting, lopping, breaking or otherwise damaging the tree as may be fixed by the District Forest Officer subject to appeal to the Collector whose decision shall be final.

APPENDIX VI.

Botanical Lists.

(*a*) *Arranged alphabetically according to Natural orders.*

Serial number and natural order.		Botanical name.	Tamil name.
		A. Trees.	
1	Anacardiace	*Anacardium occidentale*	Mundiriparuppu maram.
2	Do.	*Buchanania latifolia*	Sara-parappu maram.
3	Do.	*Buchanania lanceolata*	Muda mali maram.
4	Do.	*Lannea grandis*	Odian maram.
5	Do.	*Mangifera indica*	Mamaram.
6	Do.	*Odina wodier*	Oodia maram.
7	Do.	*Semecarpus anacardium*	Seram-kottai maram.
8	Anonaceæ	*Anona reticulata*	Rama-palam maram.
9	Do.	*Anona squamosa*	Seetha-palam maram.
10	Do.	*Polyalthia cerasoides*	Kothu-kala maram.
11	Apocynaceæ	*Alstonia scholaris*	Pola-garuda maram.
12	Do.	*Holarrhena antidysenterica*	Karu-palai, Godachali maram.
13	Do.	*Plumeria acutifolia*	Navila maram.
14	Do.	*Thevetia neriifolia*	Thiruvachipu maram.
15	Do.	*Wrightia tinctoria*	Palai maram.
16	Do.	*Wrightia tomentosa*	Veppalai maram.
17	Bignoniaceæ	*Dolichandrone falcata*	Klarvalathu maram.
18	Do.	*Dolichandrone crispa*	....
19	Do.	*Millingtonia hortensis*	Mara-malli maram.
20	Do.	*Stereospermum chelonoides*	Poom-padiri, Kalloti maram.
21	Do.	*Stereospermum suaveolens*	Padri maram.
22	Do.	*Stereospermum xylocarpum*	Vedam-kurunai maram, Kadalatti maram.
23	Bixaceæ	*Cochlospermum gossypium*	Odia maram.
24	Do.	*Hydnocarpus wightiana*	Maravatti maram.
25	Boraginaceæ	*Cordia myxa*	Nervali maram.
26	Burseraceæ	*Balsamodendron berryi*	Mul-kilvai maram.
27	Do.	*Boswellia serrata*	Dhupam maram, Kungiliam maram.
28	Do.	*Garuga pinnata*	Karu-vembu maram.
29	Do.	*Protium caudatum*	Pachaikilvai maram.
30	Capparidaceæ	*Crataeva religiosa*	Mavilangai maram.
31	Celastraceæ	*Elæodendron glaucum*	Keeri maram, Veeri maram.
32	Do.	*Pleurostylia wightii*	....
33	Combretaceæ	*Anogeissus latifolia*	Namai maram.
34	Do.	*Anogeissus acuminata*	Namai maram.
35	Do.	*Terminalia arjuna*	Maddi Maram, Nermaddi maram.
36	Do.	*Terminalia belerica*	Thani maram, Thandri maram.
37	Do.	*Terminalia chebula*	Kadukai maram.
38	Do.	*Terminalia paniculata*	Pillamarudu maram, Maddi maram.
39	Do.	*Terminalia tomentosa* (*crenulata*).	Karu-marudu maram.
40	Coniferæ	*Casuarina equisetifolia*	Chowk maram.
41	Cornaceæ	*Alangium lamarckii*	Alingi maram.
42	Dipterocarpaceæ	*Shorea talura*	Jaleri maram.
43	Ebenaceæ	*Diospyros chloroxylon*	Karuvakkanai maram.
44	Do.	*Diospyros melanoxylon*	Thumbi, Karum-thumbi maram.
45	Do.	*Diospyros montana*	Vakkanai maram.
46	Do.	*Diospyros ovalifolia*	Kadu-thoomparai maram.
47	Do.	*Maba buxifolia*	Chinerumboli maram.
48	Euphorbiaceæ	*Bridelia montana*	Mullu-vengai maram.
49	Do.	*Bridelia retusa*	Mullu-vengai maram.
50	Do.	*Cleistanthus collinus*	Woddan maram.
51	Do.	*Euphorbia trigona*	Pal-kalli maram.
52	Do.	*Givotia rottleriformis*	Velthdia maram.
53	Do.	*Mallotus philippinensis*	Kamala-podi maram.
54	Do.	*Phyllanthus emblica*	Nelli maram.
55	Do.	*Phyllanthus polyphyllus*	....
56	Do.	*Trewia nudiflora*	Kumbla maram.
57	Hernandiaceæ	*Gyrocarpus americanus* (*jacquini*).	Kosu-thamaku maram.
58	Lauraceæ	*Alseodaphne semecarpifolia*	Kaka-nagai.
59	Leguminosæ	*Acacia arabica*	Karuvela maram.
60	Do.	*Acacia ferruginea*	Paramba maram.
61	Do.	*Acacia leucophloea*	Vel-vela maram, Sarai maram.
62	Do.	*Acacia lenticularis*	....
63	Do.	*Acacia senegal*	....

Serial number and natural order.	Botanical name.	Tamil name.
64 Leguminosæ ..	.. *Acacia sundra*	.. Karungali maram.
65 Do. ..	.. *Albizzia amara*	.. Thuringi maram.
66 Do. ..	.. *Albizzia lebbek*	.. Kattu-vagai maram.
67 Do. ..	.. *Albizzia odoratissima* ..	.. Karu-vagai maram, Kal-thuringi maram.
68 Do. ..	.. *Albizzia procera*	.. Nal-velangu maram.
69 Do. ..	.. *Bauhinia racemosa* ..	.. Chitha-acha-maram, Mara-mathi maram.
70 Do. ..	.. *Butea frondosa*	.. Porasu, Muruku maram.
71 Do. ..	.. *Cassia fistula*	.. Konnai maram.
72 Do. ..	.. *Cassia siamea*	.. Pon-avarai, Karumkonnai maram.
73 Do. ..	.. *Dalbergia lanceolata* ..	.. Velangu maram.
74 Do. ..	.. *Dalbergia latifolia*	.. Etti maram.
75 Do. ..	.. *Dalbergia paniculata* ..	.. Pachali maram.
76 Do. ..	.. *Dalbergia sissoides* ..	.. Sisoo maram.
77 Do. ..	.. *Dalbergia sisoo*	.. Sisoo maram.
78 Do. ..	.. *Delonix elata*	.. Vatanarayana maram.
79 Do. ..	.. *Dichrostachys cinerea* ..	.. Vedadara, Veduthalam maram.
80 Do. ..	.. *Enterlobium saman* ..	.. Mal, Thungumungi maram.
81 Do. ..	.. *Erythrina indica*	.. Mulkurukku maram.
82 Do. ..	.. *Erythrina suberosa* ..	.. Murukku maram.
83 Do. ..	.. *Hardwickia binata* ..	.. Acha maram.
84 Do. ..	.. *Ougeina dalbergioides* ..	.. Naiponnai maram.
85 Do. ..	.. *Pithecolobium dulce* ..	.. Kodukkapulli maram.
86 Do. ..	.. *Pithecolobium saman* ..	.. Seemai kothuvai maram.
87 Do. ..	.. *Pongamia glabra*	.. Punga maram.
88 Do. ..	.. *Pterocarpus marsupium* ..	.. Vengai maram.
89 Do. ..	.. *Pterocarpus santalinus* ..	.. Chem maram.
90 Do. ..	.. *Tamarindus indica* ..	.. Pulia maram.
91 Lineæ ..	.. *Erythroxylon monogynum*	.. Chembulicha maram.
92 Loganiaceæ ..	.. *Strychnos nux-vomica* ..	.. Etti maram.
93 Do. ..	.. *Strychnos potatorum* ..	.. Thethankottai maram.
94 Lythraceæ ..	.. *Lagerstrœmia lanceolata* ..	.. Ventheku, Chinnarigi maram.
95 Do. ..	.. *Lagerstrœmia parviflora* ..	.. Pe-kadukkai maram.
96 Malvaceæ ..	.. *Bombax malabaricum* ..	.. Elava maram.
97 Do. ..	.. *Eriodendron anfractuosum*	.. Poola maram
98 Do. ..	.. *Kydia calycina*	.. Pulabendi maram.
99 Do. ..	.. *Thespesia populnea* ..	.. Puvarasu maram.
100 Melastomaceæ	.. *Memecylon edule*	.. Kasan maram.
101 Do.	.. *Memecylon umbellatum* ..	.. Perum-kasan.
102 Meliaceæ ..	.. *Chukrasia tabularis* ..	.. Arunelli maram.
103 Do. ..	.. *Melia composita*	.. ....
104 Do. ..	.. *Melia indica*	.. Vepa maram.
105 Do. ..	.. *Melia dubia*	.. Malavembu maram.
106 Do. ..	.. *Soymida febrifuga* ..	.. Sombupattai maram.
107 Moraceæ ..	.. *Ficus bengalensis* ..	.. Alai maram.
108 Do. ..	.. *Ficus gibbosa*	.. ....
109 Do. ..	.. *Ficus glomerata*	.. Athi maram.
110 Do. ..	.. *Ficus hispida*	.. Chon-athi- maram.
111 Do. ..	.. *Ficus religiosa*	.. Arasa maram.
112 Do. ..	.. *Ficus retusa*	.. Kalluichi maram.
113 Do. ..	.. *Ficus tsiela*	.. Kallathi maram.
114 Do. ..	.. *Streblus asper*	.. Kuttipala maram, Chinikoran maram.
115 Moringaceæ ..	.. *Moringa concanensis* ..	.. Kattu-murugai maram.
116 Do. ..	.. *Moringa pterygosperma* ..	.. Murungai maram.
117 Myrtaceæ ..	.. *Barrintonia acutangula* ..	.. Kaddpay maram.
118 Do. ..	.. *Careya arborea*	.. Kalkambi maram.
119 Do. ..	.. *Eugenia jambolana* ..	.. Nagai maram.
120 Do. ..	.. *Psidium guayava*	.. Koyyappala maram.
121 Oleaceæ ..	.. *Linociera intermedia* ..	.. Ellu-kanalu.
122 Do. ..	.. *Olea dioica*	.. Koli maram.
123 Do. ..	.. *Olea glandulifera*	.. Kattu-kallari.
124 Do. ..	.. *Schrebera swietenioides* ..	.. Mongalinga maram.
125 Palmæ ..	.. *Borassus flabellifer* ..	.. Panai maram.
126 Do. ..	.. *Caryota urens*	.. Kundal panai maram.
127 Do. ..	.. *Phoinix sylvestris*	.. Eecha maram.
128 Pittosporaceæ	.. *Pittosporum floribundum* ..	.. Thammattan.
129 Rhamnaceæ ..	.. *Zizyphus jujuba*	.. Yelandai maram.
130 Do. ..	.. *Zizyphus xylopyros* ..	.. Mul-upai maram.
131 Rubiaceæ ..	.. *Adina cordifolia*	.. Manja-kadambai maram.
132 Do. ..	.. *Canthium didymum* ..	.. Naluvai, Nekkini maram.

Serial number and natural order.	Botanical name.	Tamil name.
133 Rubiaceæ ..	.. *Gardenia gummifera*	Kambili-pisina maram.
134 Do. ..	.. *Gardenia latifolia*	Kothu-marikalan maram.
135 Do. ..	.. *Hymenodictyon excelsum*	Nerkadamba maram.
136 Do. ..	.. *Ixora parviflora*	Kora maram.
137 Do. ..	.. *Mitragyna parviflora* (*Stephegyne*).	Nirkadambai maram.
138 Do. ..	.. *Morinda citrifolia*	Nona maram.
139 Do. ..	.. *Morinda tinctoria*	Manjanathi nona maram.
140 Do. ..	.. *Randia brandisii*	Perum-karai.
141 Do. ..	.. *Randia uliginosa*	Vagatta maram.
142 Rutaceæ ..	.. *Aegle marmelos*	Bilva maram.
143 Do. ..	.. *Chloroxylon suietenia*	Porasu, Borasu maram.
144 Do. ..	.. *Citrus medica*	Elumuchi maram.
145 Do. ..	.. *Feronia elephnatum*	Vila maram.
146 Do. ..	.. *Limonia acidissima*	Narivala maram.
147 Do. ..	.. *Limonia crenulata*	Nalvala maram.
148 Do. ..	.. *Murraya koenigii*	Karuveppalai maram.
149 Do. ..	.. *Murraya exotica*	Katukaruveppalai maram.
150 Samydaceæ ..	.. *Casearia tomentosa*	....
151 Santalaceæ ..	.. *Santalum album*	Sandana maram.
152 Sapindaceæ ..	.. *Pistacia oleosa*	Kadal-murichi maram.
153 Do. ..	.. *Sapindus emarginatus*	Poovamkottai maram.
154 Do. ..	.. *Sapindus laurifolius*	Karadipoongai maram.
155 Do. ..	.. *Schleichera trijuga*	Pulchi maram.
156 Sapotaceæ ..	.. *Bassia latifolia*	Iluppai maram.
157 Do. ..	.. *Mimusops elengi*	Magadam maram.
158 Do. ..	.. *Mimusops hexandra*	Palæ maram.
159 Simarubaceæ ..	.. *Ailanthus excelsa*	Pee maram, Pee Nari maram.
160 Do. ..	.. *Balanites roxburghii*	Manjunda maram.
161 Sterculiaceæ ..	.. *Pterospermum heyneanum* ..	Udupai maram.
162 Do. ..	.. *Pterospermum suberifolium* ..	Muruvankai maram.
163 Do. ..	.. *Sterculia villosa*	Kottai thanuku maram.
164 Do. ..	.. *Sterculia urens*	Chin-thanuku maram.
165 Tiliaceæ ..	.. *Grewia tiliæfolia*	Thadachi maram, Thadsu maram.
166 Ulmaceæ ..	.. *Holoptelea integrifolia*	Thavasi maram.
167 Urticaceæ ..	.. *Artocarpus integrifolia*	Pela maram.
168 Verbenaceæ ..	.. *Gmelina arborea*	Kumalam maram.
169 Do. ..	.. *Premna tomentosa*	Kolakattaitheku maram.
170 Do. ..	.. *Tectona grandis*	Theku maram.
171 Do. ..	.. *Vitex altissima*	Mayil-adi maram.
172 Do. ..	.. *Vitex negundo*	Nochi maram.

B. Bamboos.

173 Gramineæ ..	.. *Bambusa arundinaceæ*	Peruvarai moongil.
174 Do. ..	.. *Dendrocalamus strictus*	Siruvarai moongil.

C. Shrubs.

175 Acanthaceæ ..	.. *Adhatoda vasica*	Adathodai.
176 Do. ..	.. *Strobilanthes*	Kurungi.
177 Apocynaceæ ..	.. *Carissa carandas*	Kila, Cherumkila.
178 Do. ..	.. *Carissa spinarum*	Sirukila.
179 Anacardiaceæ	.. *Rhus mysorensis*	Chippa maram.
180 Do.	.. *Rhus lineatus*	....
181 Asclepiadaceæ	.. *Calotropis gignatea*	Yerukku.
182 Do.	.. *Hemidesmus indicus*	Nannari.
183 Bixaceæ ..	.. *Flacourtia ramontchi*	Kothu vela.
184 Do. ..	.. *Flacourtia sepiaria*	....
185 Boraginaceæ ..	.. *Ehretia buxifolia*	Kuruvanji.
186 Cactaceæ ..	.. *Opuntia dillenii*	Mullukalli, Nagathali.
187 Capparidaceæ	.. *Capparis sepiaria*	Kattu kathrii.
188 Celastraceæ ..	.. *Gymnosporia heyneana*	Kattanji.
189 Do. ..	.. *Gymnosporia montana*	Kattanji.
190 Euphorbiaceæ	.. *Acalypha fruticosa*	Cinni.
191 Do.	.. *Breynia rhamnoides*	Sigappu-poola.
192 Do.	.. *Croton lawianus*	Kottai-mankku.
193 Do.	.. *Fluggea leucopyrus*	Kottu veppulam.
194 Do.	.. *Fluggea microcarpa*	Vellai Poola.
195 Do.	.. *Hemicyclia sepiaria*	Virai, Vellilambu.
196 Do.	.. *Jatropha curcas*	Kattuamanakku.
197 Labiatae ..	.. *Ocimum gratissima*	Thulasi.
198 Do. ..	.. *Ocimum sanctum*	Karumthulasi.

Serial number and natural order.	Botanical name.	Tamil name.
199 Leguminosæ	*Acacia latronum*	Kodivelam
200 Do.	*Aeschynomene aspera*	Netti.
201 Do.	*Cassia auriculata*	Avaram, Avarai.
202 Do.	*Cassia occidentale*	Pon-avarai.
203 Do.	*Cassia tora*	Thagara, Ossithagara.
204 Do.	*Desmodium pulchellum*	Narjuruvi.
205 Do.	*Flemingia chappar*	....
206 Do.	*Indigofera paucifolia*	Poola.
207 Do.	*Mimosa rubicaulis*	Kattu-seekai.
208 Do.	*Tephrosia perpurea* (*Mendulea suberosa*).	Kavali.
209 Liliaceæ	*Aloe vera*	Kathali.
210 Lythraceæ	*Lawsonia inermis*	Aivanam.
211 Malpighiaceæ	*Hiptage madablota*	Madu-malati, Kuruvathi.
212 Malvaceæ	*Pavonia zeylanica*	....
213 Meliaceæ	*Cipadessa fruticosa*	Savatu chedi.
214 Oleaceæ	*Nyctanthes arbortristis*	Pavelum.
215 Do.	*Ximenia americana*	Kale.
216 Palmæ	*Phoenix acaulis*	Eechampul.
217 Do.	*Phoenix humilis*	Siruinji.
218 Pandanaceæ	*Pandanus tectorius*	Thalai.
219 Plumbaginaceæ	*Plumbago zeylanica*	....
220 Rhamnaceæ	*Rhamnus wightii*	....
221 Do.	*Scutia indica*	Kokki mullu...
222 Do.	*Zizyphus nummularia*	Nari-yelandai.
223 Do.	*Zizyphus oenoplia*	Soorai.
224 Do.	*Zizyphus glabrata*	Kottai yelandai.
225 Rubiaceæ	*Canthium parviflorum* (*plectronia*).	Sengarai.
226 Do.	*Chomelia asiatica*	Thirani.
227 Do.	*Pavetta indica*	Pavattai.
228 Do.	*Randia dumetorum*	Karai, Marivalan, Marakalam.
229 Do.	*Webera asiatica*	Chintharni.
230 Do.	*Webera corymbosa*	Tharni.
231 Rutaceæ	*Atlantia monophylla*	Kattu elimichi.
232 Do.	*Clausena indica*	Nana.
233 Do.	*Paramignya monophylla*	Molongarani.
234 Do.	*Toddalia asiatica*	Molacarnai.
235 Do.	*Toddalia aculeata*	Kattu molaga, Porivalan.
236 Sapindaceæ	*Allophylus cobbe*	Siru-sale.
237 Do.	*Allophylus serratus*	Kuva-Koothi.
238 Do.	*Dodonaea viscosa*	Vellari.
239 Solanaceæ	*Datura fastiosa*	Vel-oomathu.
240 Do.	*Datura Stiamonium*	Oomathu.
241 Do.	*Solanum trilobatum*	Sundakkai.
242 Do.	*Solanum zanthocarpus*	Kandamkathari.
243 Do.	*Solanum verbascifolium*	Anaisundakkai.
244 Do.	*Solanum giganteum*	Sambal kiluvai.
245 Sterculiaceæ	*Helicteres isora*	Valamburi, Idamburi.
246 Tiliaceæ	*Grewia hirsuta*	....
247 Do.	*Grewia columnaris*	....
248 Verbenaceæ	*Lantana indica.*	Unni.
249 Zingiberaceæ	*Zingiber casumunar*	Kattu manjal.

D. Climbers.

Serial number and natural order.	Botanical name.	Tamil name.
250 Ampelideæ	*Ampelocissus latifolia*	Kattu kodimundari.
251 Do.	*Cissus quadrangularis*	Perandai.
252 Anonaceæ	*Uvaria narum*	Kattu-valai.
253 Apocynaceæ	*Ichnocarpus frutescens*	Oothal kodi.
254 Aristolochiaceæ	*Aristolochia indica*	....
255 Asclepiadaceæ	*Gymnema sylvestre*	Sirupalai kodi.
256 Do.	*Pergularia extensa*	Seendal kodi.
257 Do.	*Secamone emetica*	Seerai kodi.
258 Celastraceæ	*Celastrus paniculata*	....
259 Combretaceæ	*Combretum ovalifolium*	Vennangu kodi.
260 Covolvulaceæ	*Argyreia speciosa*	Kakattan.
261 Do.	*Cuscutta*	....
262 Do.	*Lettsomia elliptica*	Onan kodi.
263 Dioscoreaceæ	*Dioscorea hispida*	Kaval kodi.
264 Do.	*Dioscorea pentaphylla*	Kattu velli.
265 Leguminosæ	*Abrus precatorius*	Kundumani.
266 Do.	*Abrus pulchellus*	Vellai kundumani.
267 Do.	*Acacia caesia*	Kari karan, Vellandu.
268 Do.	*Acacia concinna*	Seekayi.

Serial number and natural order.		Botanical name.	Tamil name.
269	Leguminosæ	*Acacia inssia*	Indu mullu.
270	Do.	*Bauhinia vahlii*	Kattu mandarai.
271	Do.	*Butea superba*	....
272	Do.	*Caesalpinia bonducella*	Gajjikai, Kalachikai.
273	Do.	*Canvalia virosa*	....
274	Do.	*Derris scandens*	Punali.
275	Do.	*Millettia auriculata*	....
276	Do.	*Mucuna gigantea*	Kakkavali.
277	Do.	*Pterolobium indicum.*	Kari-indi-Pulithadiki.
278	Do.	*Spatholobus roxburghii*	Kattu avarai kodi.
279	Liliaceæ	*Asparagus racemosus*	Thannuta kodi.
280	Do.	*Gloriosa superba*	Konnoou.
281	Do.	*Smilax zeylanica*	....
282	Lineæ	*Hugonia mystax*	Kodi veerai.
283	Minispermaceæ	*Cocculus villosus*	Kotu kodi.
284	Oleaceæ	*Jasminum arborescens*	Kattu malligai.
285	Ranuneulaceæ	*Narvelia zeylanica*	Naruvalan kodi.
286	Rhamnaceæ	*Ventilago calyculata*	Surai, Vembalam.
287	Do.	*Ventilago madraspatana*	Vembalam.

(*b*) *Arranged alphabetically according to Tamil names.*

A. Trees.

Serial number and Tamil name.		Botanical name.	Natural order.
1	Acha maram	*Hardwickia binata*	Leguminosæ.
2	Alai maram	*Ficus bengalensis*	Moraceæ.
3	Alingi maram	*Alangium lamarckii*	Cornaceæ.
4	Arasa maram	*Ficus religiosa*	Moraceæ.
5	Arunelli maram	*Chukrasia tabularis*	Meliaceæ.
6	Athi maram	*Ficus glomerata*	Moraceæ.
7	Bilva maram	*Aegle marmelos*	Rutaceæ.
8	Borasu maram	*Chloroxylong swietenia*	Do.
9	Chembulicha maram	*Erythroxylon monogynum*	Lineæ.
10	Chem maram	*Pterocarpus santlainus*	Leguminosæ.
11	Chinerumboli maram	*Maba buxifolia*	Ebanaceæ.
12	Chini-koran maram	*Streblus asper*	Moraceæ.
13	Chinnarigi maram	*Lagerstroemia lanceolata*	Lythraceæ.
14	Chin-thanaku maram.	Sterculia urens	Sterculiaceæ.
15	Chitha acha maram	Bauhinia racemosa	Leguminosæ.
16	Chon athi maram	Ficus hispida	Moraceæ.
17	Chowk maram	*Casuarina equisetifolia*	Coniferæ.
18	Dhupam maram	*Boswellia serrata*	Burseraceæ.
19	Eecha maram	*Phoenix sylvestris*	Palmæ.
20	Eetti maram	*Dalbergia latifolia*	Leguminosæ.
21	Elava maram	*Bombax malabaricum*	Malvaceæ.
22	Ellu-kanalu maram	*Linociera intermedia*	Oleaceæ.
23	Elumuchi maram	*Citrus medica*	Rutaceæ.
24	Etti maram	*Strychnos nux-vomica*	Loganiaceæ.
25	Godachali maram	*Holarrhena antidysenterica*	Apocynaceæ.
26	Iluppai maram	*Bassia latifolia*	Sapotaceæ.
27	Jaleri maram	*Shorea talura*	Dipterocarpaceæ.
28	Kadal-murichi maram	*Pistacia oleosa*	Sapindaceæ.
29	Kadalatti maram	*Stereospermum xyloarpum*	Bignoniaceæ.
30	Kaddapay maram	*Barringtonia acutangula*	Myrtaceæ.
31	Kadukai maram	*Terminalia chebula*	Combretaceæ.
32	Kadu-thoomparai maram.	*Diospyros ovalifolia*	Ebenaceæ.
33	Kaka-nagai maram	*Alseodaphne semicarpifolia*	Lauraceæ.
34	Kalkambi maram	*Careya arborea*	Myrtaceæ.
35	Kal-thuringi maram	*Albizzia odoratissima*	Leguminosæ.
36	Kallu-athi maram	*Ficus tsiela*	Moraceæ.
37	Kalluichi maram	*Ficus retusa*	Do.
38	Kamalapodi maram	*Mallotus philippinensis*	Euphorbiaceæ.
39	Kambili-pisina maram.	*Gardenia gummifera*	Rubiaceæ.
40	Karu-vagai maram	*Albizzia odoratissima*	Leguminosæ.
41	Karum-konnai maram.	*Cassia siamea*	Do.
42	Karumgali maram	*Acacia sundra*	Do.
43	Karuveppalai maram.	*Murraya koenigii*	Rutaceæ.
44	Karu-marudu maram	*Terminalia tomentosa*	Combretaceæ.
45	Karuvakkanai maram.	*Diospyros chloroxylon*	Ebenaceæ.
46	Karum-thumbi maram.	*Diospyros melanoxylon*	Do.

Serial number and Tamil name.	Botanical name.	Natural order.
47 Karuvela maram ..	*Acacia arabica*	Leguminosæ.
48 Karupalai maram ..	*Holarrhena antidysenterica* ..	Apocynaceæ.
49 Karuvembu maram ..	*Garuga pinnata*	Burseraceæ.
50 Karadipoongai maram.	*Sapindus laurifolius*	Sapindaceæ.
51 Kasan maram ..	*Memecylon edule*	Melastomaceæ.
52 Kattu-kallari maram.	*Olea glandulifera*	Oleaceæ.
53 Kattukaruveppalai maram.	*Murraya exotica*	Rutacæ.
54 Kattumurungai maram.	*Muringa concanensis*	Moringaceæ.
55 Kattu-vagai maram ..	*Albizzia lebbek*	Leguminosæ.
56 Keeri maram	*Elaodendron glaucum*	Celastraceæ.
57 Klarvalathu maram ..	*Dolichandrone falcata*	Bignoniaceæ.
58 Kodukkapulli maram.	*Pithecolobium dulce*	Leguminosæ.
59 Kolakattai thekumaram	*Premna tomentosa*	Verbenaceæ.
60 Koli maram	*Olea dioica*	Oleaceæ.
61 Konnai maram ..	*Cassia fistula*	Leguminosæ.
62 Kora maram	*Ixora parviflora*	Rubiaceæ.
63 Kosu-thamaku maram.	*Gyrocarpus americanus* (*jacquinii*).	Hernandiaceæ.
64 Kothu-marikalan maram.	*Gardenia latifolia*	Rubiaceæ.
65 Kattai-thanaku maram.	*Sterculia villosa*	Sterculiaceæ.
66 Koyyappala maram..	*Psidium guayava*	Myrtaceæ.
67 Kothu-kala maram ..	*Polyalthia cerasoides*	Anonaceæ.
68 Kumbla maram ..	*Trewia nudiflora*	Euphorbiaceæ.
69 Kumalam maram ..	*Gmelina arborea*	Verbenaceæ.
70 Kundalpanai maram.	*Caryota urens*	Palmæ.
71 Kungiliam maram ..	*Boswellia serrata*	Burseraceæ.
72 Kuttipala maram ..	*Streblus asper*	Moraceæ.
73 Maddi maram ..	*Terminalia arjuna*	Combretaceæ.
74 Maddi maram ..	*Terminalia paniculata*	Do.
75 Magadam maram ..	*Mimusops elengi*	Sapotaceæ.
76 Mal maram	*Enterlobium saman*	Leguminosæ.
77 Malavembu maram ..	*Melia dubia*	Meliaceæ.
78 Mamaram	*Mangifera indica*	Anacardiaceæ.
79 Manjanathinona maram.	*Morinda tinctoria*	Rubiaceæ.
80 Manjakadambai maram.	*Adina cordifolia*	Do.
81 Manjunda maram ..	*Balanites roxiburghii*	Simarubaceæ.
82 Maramalli maram ..	*Millingtonia hortensis*	Bignoniaceæ.
83 Mara-mathi maram ..	*Bauhinia racemosa*	Leguminosæ.
84 Maravatti maram ..	*Hydnocarpus wightiana*	Bixaceæ.
85 Mavilangai maram ..	*Crataeva religiosa*	Capparidaceæ.
86 Mayil-adi maram ..	*Vitex altissima*	Verbenaceæ.
87 Mogalinga maram ..	*Schrebera swietenioides*	Oleaceæ.
88 Muda mali maram ..	*Buchanania lanceolata*	Anacardiaceæ.
89 Mul-upai maram ..	*Zizyphus xylopyrus*	Rhamnaceæ.
90 Mul-kilvai maram ..	*Balsamodendron berryi*	Burseraceæ.
91 Mullu-vengai maram.	*Bridelia montana*	Euphorbiaceæ.
92 Mullu-vengai maram	*Bridelia retusa*	Leguminosæ.
93 Mulmuruku maram ..	*Eryrhrina indica*	Do.
94 Mundiriparappu maram.	*Anacardium occidentale*	Anacardiaceæ.
95 Murukku maram ..	*Erythrina suberosa*	Do.
96 Muruku maram ..	*Butea frondosa*	Leguminosae.
97 Murangai maram ..	*Moringa pterygosperma*	Moringaceæ.
98 Muruvankai maram ..	*Pterospermum suberifolium* ..	Sterculiaceæ.
99 Nagai maram ..	*Eugenia jambolana*	Myrtaceæ.
100 Naiponnai maram ..	*Ougeinia dalbergioides*	Leguminosæ.
101 Naluvai, Nekkini maram.	*Canthium didymum*	Rubiaceæ.
102 Nalvala maram ..	*Limonia crenulata*	Rutaceæ.
103 Nal-velangu maram ..	*Albizzia procera*	Leguminosæ.
104 Namai maram ..	*Anogeissus latifolia*	Combretaceæ.
105 Namai maram ..	*Anogeissus acuminata*	Do.
106 Narivala maram ..	*Limonia acidissima*	Rutaceæ.
107 Navila maram ..	*Plumeria acutifolia*	Apocynaceæ.
108 Nelli maram	*Phyllanthus emblica*	Euphorbiaceæ.
109 Nervali maram ..	*Cordia myxa*	Boraginaceæ.
110 Nerkadamba maram.	*Hymenodictyon excelsum*	Rubiaceæ.
111 Nermaddi maram ..	*Terminalia arjuna*	Combretaceæ.
112 Nirkadambai maram.	*Mitragyna parviflora* (*Stephegyne*).	Rubiaceæ.
113 Nona maram	*Morindacitrifolia*	Do.

Serial number and Tamil name.	Botanical name.	Natural order.
114 Nochi maram	*Vitex negundo*	Verbenaceæ.
115 Odia maram	*Cochlospermum gossypum*	Bixaceæ.
116 Odian maram	*Lannea grandis*	Anacardiaceæ.
117 Oodia maram	*Odina wodier*	Do.
118 Pachali maram	*Dalbergia paniculata*	Leguminosæ.
119 Pachai-kilvai maram.	*Protium caudatum*	Burseraceæ.
120 Padri maram	*Stereospermum suaveolens*	Bignoniaceæ.
121 Palae maram	*Mimusops hexandra*	Sapotaceæ.
122 Pala-garuda maram	*Alstonia scholaris*	Apocynaceæ.
123 Palai maram	*Wrightia tinctoria*	Do.
124 Palkalli maram	*Euphorbia trigona*	Euphorbiaceæ.
125 Panai maram	*Borassus flabellifer*	Palmæ.
126 Paramba maram	*Acacia ferruginea*	Leguminosæ.
127 Pee maram	*Ailanthus excelsa*	Simarubaceæ.
128 Pee-nari maram	*Ailanthus excelsa*	Do.
129 Pela maram	*Artocarpus integrifolia*	Urticaceæ.
130 Pe-kadukkai maram.	*Lagerstromia parviflora*	Lythraceæ.
131 Perum-karai maram.	*Randia brandisii*	Rubiaceæ.
132 Perum-kasan maram.	*Memecylon umbellatum*	Melastomaceæ.
133 Pillamarudu maram	*Terminalia paniculata*	Combretaceæ.
134 Pon-avarai maram	*Cassia siamea*	Leguminosæ.
135 Poola maram	*Eriodendron anfractuosum*	Malvaceæ.
136 Poovamkottai maram.	*Sapindus emarginatus*	Sapindaceæ.
137 Porasu maram	*Butea frondosa*	Leguminosæ.
138 Porasu maram	*Chloroxylon suietenia*	Rutaceæ.
139 Poompadiri maram	*Stereospermum chelonoides*	Bignoniaceæ.
140 Pulabendi maram	*Kydia calycina*	Malvaceæ.
141 Pulchi maram	*Schleichera trijuga*	Sapindaceæ.
142 Pulia maram	*Tamarindus indica*	Leguminosæ.
143 Punga maram	*Pongamia glabra*	Do.
144 Puvarasu maram	*Thespesia polulnea*	Malvaceæ.
145 Rama-palam maram.	*Anona reticulata*	Anonaceæ.
146 Sandana maram	*Santalum album*	Santalaceæ.
147 Sara-parappu maram.	*Buchanania latifolia*	Anacardiaceæ.
148 Sarai maram	*Acacia leucophloea*	Leguminosæ.
149 Seemaikothuvai maram.	*Pithecolobium saman*	Do.
150 Seetha-palam maram.	*Anona squamosa*	Anonaceæ.
151 Seram-kottai maram.	*Semecarpus anacardium*	Anacardiaceæ.
152 Sisoo maram	*Dalbergia sissoides*	Leguminos.æ
153 Sisoo maram	*Dalbergia sissoo*	Do.
154 Sombupattai maram.	*Soymida febrifuga*	Meliaceæ.
155 Thadachimaram	*Grewia tilioefolia*	Tillaceæ.
156 Thadasu maram	*Grewia tiljoefolia*	Do.
157 Thammattan maram.	*Pittosporum floribundum*	Pittosporaceæ.
158 Thandri maram	*Terminali belerica*	Combretaceæ.
159 Thani maram	*Terminalia belerica*	Do.
160 Thavasi maram	*Holoptelia integrifolia*	Ulmaceæ.
161 Theku maram	*Tectona grandis*	Verbenaceæ.
162 Thethankottai maram.	*Strychnos potatorum*	Loganiaceæ.
163 Thiruvachipu maram.	*Thevetia neriifolia*	Apocynaceæ.
164 Thumbi maram	*Diospyros melanoxylon*	Ebenaceæ.
165 Thumgumunji maram.	*Enterlobium saman*	Leguminosæ.
166 Thuringi maram	*Albizzia ammra*	Do.
167 Udupai maram	*Pteorspermum heyneanum*	Sterculiaceæ.
168 Vagatta maram	*Randia uliginosa*	Rubiaceæ.
169 Vakkanai maram	*Diospyros montana*	Ebenaceæ.
170 Vatanarayana maram.	*Delonix elata*	Leguminosæ.
171 Vedadaram maram	*Dichrostachys cinerea*	Do.
172 Vedamkurunai maram.	*Stereospermum xylocarpum*	Bignoniaceæ.
173 Veduthalam maram	*Dichrostachys cinerea*	Leguminosæ.
174 Veerai maram	*Elaeodendron glaucum*	Celastraceæ.
175 Velangu maram	*Dalbergia lancdolata*	Leguminosæ.
176 Velthadai maram	*Givotia rottleriformis*	Euphorbiaceæ.
177 Velvelam maram	*Acacia leucophloea*	Leguminosæ.
178 Vengai maram	*Pterocarpus marsupium*	Do.
179 Ventheku maram	*Lageratroemia lanceolata*	Lythraceæ.
180 Vepa maram	*Melia indica*	Meliaceæ.
181 Veppalai maram	*Wightia tincotoria*	Apocynaceæ.
182 Vila maram	*Feronia elephantum*	Rutaceæ.
183 Woddan maram	*Cleistanthus collinus*	Euphorbiaceæ.
184 Yelandai maram	*Zizyphus jujuba*	Rhamnaceæ.

Serial number and Tamil name.	Botanical name.	Natural order.
	B. Bamboos.	
185 Peruvarai moongil	*Bambusa arundinacea*	Gramineæ.
186 Siruvarai moongil	*Dendrocalamus strictus*	Do.
	C. Shrubs.	
187 Adathodai	*Adhatoda vasica*	Acanthaceæ.
188 Aivanam	*Lawsonia inermiss*	Lythraceæ.
189 Anaisundakkai	*Solanum verbascifolium*	Solanaceæ.
190 Avaram	*Cassia auriculata*	Leguminosæ.
191 Avarai	*Cassia auriculata*	Do.
192 Cherumkila	*Carissa carandas*	Apocynaceæ.
193 Chintharni	*Webera asiatica*	Rubiaceæ.
194 Chippa maram	*Rhus mysorensis*	Anacardiaceæ.
195 Cinni	*Acalypha fruticosa*	Euphorbiaceæ.
196 Eechampul	*Phoenix acaulis*	Palmæ.
197 Idamburi	*Helicteres isora*	Sterculiaceæ.
198 Kale	*Ximenia americana*	Oleaceæ.
199 Kandamkatharai	*Solanum zanthocarpus*	Solanaceæ.
200 Karai	*Randia dumetorum*	Rubiaceæ.
201 Karum-thulasi	*Ocimum sanctum*	Labiatæ.
202 Kathali	*Aloe vera*	Liliaceæ.
203 Kattanji	*Gymnosporia montana*	Celastraceæ.
204 Kattanji	*Gymnosporia heyneana*	Do.
205 Kattu elimichi	*Atlantia monophylla*	Rutaceæ.
206 Kattu manjal	*Zingiber casumunar*	Zingiberaceæ.
207 Kattu molaga	*Toddalia aculeata*	Rutaceæ.
208 Kattu seekai	*Mimosa rubicaulis*	Leguminosæ.
209 Kattu kathiri	*Capparis sepiaria*	Capparidaceæ.
210 Kattu amanakku	*Jatropha curcas*	Euphorbiaceæ.
211 Kavali	*Tephrosia perpurea (Mundulea suberosa).*	Leguminosæ.
212 Kila	*Carissa carandas*	Apocynaceæ.
213 Kodivelam	*Acacia latronum*	Leguminosæ.
214 Kokki mullu	*Scutia indica*	Rhamnaceæ.
215 Kothu vela	*Flacourtia ramontchi*	Bixaceæ.
216 Kottai-yelandai	*Zizyphus glabrata*	Rhamnaceæ.
217 Kottai-manakku	*Croton lawianus*	Euphorbiaceæ.
218 Kottu veppulam	*Fluggea leucopyrus*	Do.
219 Kurungi	*Strobilanthussp*	Acanthaceæ.
220 Kuruvanji	*Ehretia baxifolia*	Boraginaceæ.
221 Kuva-koothi	*Allophylus serratus*	Sapindaceæ.
222 Madu-malati	*Hiptage madablcta*	Malpighiaceæ.
223 Marakalam	*Randia dumetorum*	Rubiaceæ.
224 Marivalan	*Randia dumetorum*	Do.
225 Mola-carnai	*Toddalia asiatica*	Rutaceæ.
226 Molongarani	*Paramignya monophylla*	Do.
227 Mullukalli	*Opuntia dillenii*	Cactaceæ.
228 Nagathali	*Opuntia dillenii*	Do.
229 Nana	*Clausena indica*	Rutaceæ.
230 Nannari	*Hemidesmus indicus*	Asclepiadaceæ.
231 Narjuruvi	*Desmodium pulchellum*	Leguminosæ.
232 Nariyelandai	*Zizyphus nummularia*	Rhamnaceæ.
233 Netti	*Aeschynomene aspera*	Leguminosæ.
234 Oomathu	*Datura stiamonium*	Solanaceæ.
235 Oosithagara	*Cassia tora*	Leguminosæ.
236 Pavattai	*Pavetta indica*	Rubiaceæ.
237 Pavelum	*Nyctanthes arbortristis*	Oleaceæ.
238 Pon-avarai	Cassia occidentale	Leguminosæ.
239 Poola	*Indigofera paucifolia*	Do.
240 Porivalan	*Toddalia aculeata*	Rutaceæ.
241 Sambal kiluvai	*Solanum giganteum*	Solanaceæ.
242 Savatu-chedi	*Cipadessa fruticosa*	Meliaceæ.
243 Sengarai	*Canthium parviflorum*	Rubiaceæ.
244 Sigappu-poola	*Breynia rhamnoides*	Euphorbiaceæ.
245 Siru-sale	*Allophylus cobbe*	Sapindaceæ.
246 Siru-inji	*Phoenix humilis*	Palmæ.
247 Siru-kila	*Carrisa spinarum*	Apocynaceæ.
248 Soorai	*Zizyphus oenoplia*	Rhamnaceæ.
249 Sundakkai	*Solanum trilobatum*	Solanaceæ.
250 Thagara	*Cassia tora*	Leguminosæ.
251 Thalai	*Pandanus tectorius*	Pandanaceæ.

Serial number and Tamil name.	Botanical name.	Natural order.
252 Tharni	*Webera corymbosa*	Rubiaceæ.
253 Thirani	*Chomelia asiatica*	Do.
254 Thulasi	*Ocimum gratissium*	Labiatæ.
255 Unni	*Lantana indica*	Verbenaceæ.
256 Valamburi	*Helecteres isora*	Sterculiaceæ.
257 Vel-oomathu	*Datura fastiosa*	Solanaceæ.
258 Vellari	*Dodonaea viscoca*	Sapindaceæ.
259 Vellai poola	*Fluggea microcarpa*	Euphorbeaceæ.
260 Vellilambu	*Hemicyclia sepiaria*	Do.
261 Virai	*Hemicyclia sepiaria*	Do.
262 Yerukku	*Calotropis gigantea*	Asclepiadaceæ.

D. Climbers.

263 Gajjikai	*Caesalpinia bonducella* ..	Leguminosæ.
264 Indu-mullu, Seengai-kodi.	*Acacia intsia*	Do.
265 Kalachikai	*Caesalpinia bonducella*	Do.
266 Kakattan	*Argyreia speciosa*	Convolvulaceæ.
267 Kakkavali	*Mucuna gigantea*	Leguminosæ.
268 Kari karan	*Acacia caesia*	Do.
269 Kari indi	*Pterolobium indicum*	Do.
270 Kattu-avaraikodi ..	*Spatholobus roxburghii*	Do.
271 Katukodimundari ..	*Ampelocissus latifolia*	Ampelideæ.
272 Kattumandarai ..	*Bauhinia vahlii*	Leguminosæ.
273 Kattu malligai ..	*Jasminum arborescens*	Oleaceæ.
274 Kattu-valai	*Uvaria narum*	Anonaceæ.
275 Kattu-velli	*Dioscorea pentaphylla*	Dioscoreaceæ.
276 Kavalkodi	*Dioscorea hispida*	Do.
277 Kodi veerai	*Hugonia mystax*	Lineæ.
278 Konnoou	*Gloriosa superba*	Liliaceæ.
279 Kottukodi	*Cocculus villosus*	Menispermaceæ.
280 Kundumani	*Abrus precatorius*	Leguminosæ.
281 Naruvalankodi ..	*Narvelia zeylanica*	Ranunculaceæ.
282 Onankodi	*Lettsomia elliptica*	Convolculaceæ.
283 Oothalkodi	*Ichnocarpus frutescens*	Apocynaceæ.
284 Perandai	*Cissus quadrangularis*	Ampelideæ.
285 Punali	*Derris scandens*	Leguminosæ.
286 Puli-thadaki	*Pterolobium indicum*	Do.
287 Seekayi	*Acacia concinna*	Do.
288 Seendalkodi	*Pergularia extensa*	Asclepiadaceæ.
289 Seeraikodi	*Secamone emetica*	Do.
290 Siru-palaikodi ..	*Gymnema sylvestre*	Do.
291 Sural	*Ventilago calyculata*	Rhamnaceæ.
292 Thannuta kodi ..	*Asparagus racemosus*	Liliaceæ.
293 Vennangu kodi ..	*Combretum ovalifolium*	Combretaceæ.
294 Vellaikundu mani ..	*Abrus pulchellus*	Leguminosæ.
295 Vellandu	*Acacia caesia*	Do.
296 Vembalam	*Ventilago calyculata*	Rhamnaceæ.
297 Vembalam	*Ventilago madraspatana*	Do.

APPENDIX VII.

Statement of Grazing Incidence.

Period 1924–25 to 1933–34.

Year.	Odagathur range.		Santavasal.		Polur.		Tiruvannamalai.		Division.	
	Area open to grazing acres.	Number of cattle grazed cow units.	Area open to grazing acres.	Number of cattle grazed cow units.	Area open to grazing acres.	Number of cattle grazed cow units.	Area open to grazing acres.	Number of cattle grazed cow units.	Area open to grazing acres.	Number of cattle grazed cow units.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1924–25 ..	87,040·00	20,817·5	44,221·50	16,793·5	56,212·50	18,898·0	91,611·00	25,020·5	279,085·00	81,529·5
1925–26 ..	84,480·00	20,486·0	66,403·00	15,468·0	62,541·00	22,220·0	102,994·00	16,392·0	336,418·00	74,566·0
1926–27 ..	97,204·75	27,396·5	40,398·00	14,828·0	75,692·00	17,984·0	61,017·75	20,926·0	274,312·50	81,134·5
1927–28 ..	93,262·90	27,615·5	61,640·20	16,556·5	69,674·25	17,301·5	71,099·14	17,279·0	295,676·49	78,752·5
1928–29 ..	100,915·18	29,201·5	34,125·00	16,826·0	39,064·00	17,506·5	41,028·10	13,844·0	215,132·28	77,378·0
1929–30 ..	92,438·00	31,371·0	68,593·00	18,652·5	69,860·00	16,819·0	49,532·10	12,826·0	280,423·10	79,668·5
1930–31 ..	92,096·00	28·092·0	68,630·00	16,927·5	69,807·00	15,895·0	49,485·00	12,500·5	280,018·00	73,415·0
1931–32 ..	92,498·00	22,948·0	68,635·00	16,435·5	70,024·00	16,379·0	49,416·00	11,529·0	280,573·00	67,291·5
1932–33 ..	92,437·00	22,437·0	41,199·00	15,870·0	39,194·00	15,774·0	40,565·10	11,123·5	213,895·10	65,204·5
1933–34 ..	98,436·59	20,465·5	68,512·20	16,533·5	69,914·25	15,604·5	49,127·42	12,275·0	285,990·46	64,878·5
Total ..	**931,308·42**	**250,830·5**	**562,356·90**	**164,891·0**	**641,983·00**	**174,381·5**	**605,875·61**	**153,715·5**	**2,741,523·93**	**743,818·5**
Average ..	**93,130·84**	**25,083·05**	**56,235·69**	**16,489·1**	**64,198·30**	**17,438·15**	**60,587·56**	**15,371·55**	**274,152·39**	**74,381·85**
Incidence.	3·7		3·4		3·6		3·9		3·7	

APPENDIX VIII.

FORM VIII.

Control of fellings in the Sandal Working Circle.

Felling Series.

Enclosures of the Range.

Prescribed.—Extraction of dead trees, including all stumps and roots, and green fallen or broken stems and branches (Working Plan paragraph 256), once in six years in each coupe of nine felling series (Working Plan paragraph 259) annually in 57 enclosures and biennially in 30 enclosures (Working Plan paragraph 260).

Prescribed.			Done.	
Year.	Area.	*Coupe number.* Number of enclosures.	Year(s) of actual working.	Remarks.
(1)	(2)	(3)	(4)	(5)
		(Sample entries for the Alleri Felling Series.)		
	ACS.			
1936–37 ..	1,632	III	1936–37.	
1937–38 ..	821	IV	1937–38.	
1938–39 ..	1,261	V	1939–40	Coupe V not worked in 1938–39 as extraction was confined to wind-blown trees in the Alleri and Thongamalai felling series. Deviation sanctioned in Chief Conservator's No. dated
1939–40 ..	1,458	VI		
1940–41 ..	966	I		
1941–42 ..	1,618	II		
1942–43 ..	1,632	III		
1943–44 ..	821	IV		
1944–45 ..	1,261	V		
1945–46 ..	1,458	VI		
		(Sample entries for the enclosures of the Santavasal Range.)		
1936–37 ..	7,674	35		
1937–38 ..	6,621	22		
1938–39 ..	7,674	35		
1939–40 ..	6,621	22		
1940–41 ..	7,674	35		
1941–42 ..	6,621	22		
1942–43 ..	7,674	35		
1943–44 ..	6,621	22		
1944–45 ..	7,674	35		
1945–46 ..	6,621	22		

Note.—A separate form will be used for each felling series or for the enclosures of each range.

FORM VIII (*a*).

Record of yield from the Sandal Working Circle.

Estimated outturn.—50 tons annually (Working Plan paragraph 253).

Year.	Locality worked. Felling series or enclosures.	Coupe No. or number of enclosures.	Area.	Outturn.				Remarks.
(1)	(2)	(3)	(4)	(5)				(6)
			ACS	TONS.	CWT.	QR.	LB.	
1936–37 ..	Alleri	III	1,632					
	Thongamalai	III	1,035					
	Amerdi	III	2,010					
	Nadanur	III	869					
	Veerappanur	III	1,333					
	Komattiyur	III	768					
	Patrakad	III	5,242					
	Moolakad	III	1,882					
	Tiruvannamalai ..	III	588					
	*Vellore Range enclosures.	10	1,359					
	*Santavasal Range enclosures.	35	7,674					
	*Polur Range enclosures.	35	7,217					
			Total ..					
1937–38 ..	Alleri	IV	821					
	Thongamalai	IV	863					
	Amerdi	IV	1,058					
	Nadanur	IV	1,759					
	Veerappanur	IV	1,400					
	Komattiyur	IV	1,008					
	Patrakad	IV	2,609					
	Moolakad	IV	2,713					
	Tiruvannamalai ..	IV	920					
	*Vellore Range enclosures.	10	1,359					
	*Santavasal Range enclosures.	22	6,621					
	*Polur Range enclosures.	32	7,425					
			Total ..					

**Note.*—The enclosures for 1938–39, 1940–41 and so on will be the same as those for 1936–37, while those for the alternate years will be the same as those for 1937–38.

FORM IX.

Felling Series Journal for the Sandal Working Circle.

Felling Series.

Enclosures in the Range.

Year. (1)	Coupe number. (2)	Girth class. (3)	Number of trees extracted in each girth class. Heart wood. (4)	Sapwood. (5)	Percentage of sapwood to total number. (6)	Roughwood out-turn from each girth class. Total lbs. (7)	Average per heartwood tree. (8)	(9)
1936–37	I	0–6″	..	..	..	..	..	Av. of CI/1st year.
1937–38.	II	..	..	..	..	..	..	Av. of C. II/2nd year.
Total ..	C. I & II/2 years.	..	..	..	..	..	..	Av. of C. I & II/2 years.
1938–39.	III	..	..	..	..	..	..	Av. of C. III/3rd year.
Total ..	C. I–III/ 3 years.	..	..	..	..	..	..	Av. of C. I–III/ 3 years.
1939–40	IV	..	..	..	..	..	..	Av. of C. IV/4th year.
Total ..	C. I–IV/4 years.	..	..	..	..	..	..	Av. of C. I–IV/4 years.

and so on for each girth class. As work proceeds from year to year the progressive felling series/enclosure averages must of course be struck by totalling the number of trees extracted in all coupes/enclosures and the yields obtained and not by "averaging" the averages.

1936–37.	I	6–12″
1937–38.	II	
Total ..	C. I & II/2 years.	
1938–39.	III	
Total ..	C. I–III/3 years.	
1939–40.	IV	
		(Space for 10 years in all.)
19 ..	..	12–18″
		(Space for 10 years in all.)
		18–24″
		(and so on for higher girth classes).

Note.—I. When enclosures are being dealt with column (2) will be left blank.
II. A separate form will be used for each felling series or for the enclosures in each range.

FORM XI.

Control of fellings in the Fuel and Small Timber Working Circle.

______ Regular / Reserve felling series.

Prescribed.—One coupe in each felling series to be worked each year, should there be a demand (Working Plan paragraph 281).

Prescribed. Year. (1)	Average area of coupes acres. (2)	Done. Coupe No. (3)	Year of working. (4)	Area worked acres. (5)	Remarks. (6)
		(Sample entries for Komiar Felling Series.)			
1936–37					
1937–38					
1938–39					
1939–40					
1940–41					
1941–42	77·5				
1942–43					
1943–44					
1944–45					
1945–46					

Note.—A separate form will be used for each felling series.

FORM XI (*a*).

Record of yield from the Fuel and Small Timber Working Circle.

————————— $\frac{\text{Regular}}{\text{Reserve}}$ felling series.

Estimated outturn tons of firewood per acre.
cubic feet of small timber per acre.

Year. (1)	Locality worked. Coupe No. (2)	Area, acres. (3)	Outturn. (4) Kind.	Quantity.	Remarks. (5)
			Firewood	.... tons.	
			Small timber	.... cubic feet.	

NOTE.—A separate form will be used for each felling series.

FORM XII.

Control of Rab Regeneration in the Fuel and Small Timber Working Circle.

————————— $\frac{\text{Regular}}{\text{Reserve}}$ felling series.

Prescriptions (*suggested*).—Rab regeneration limited to half the area of each coupe by the middle of September in the year of felling and over the rest of the coupe during the last week of April following the year of felling (Working Plan paragraph 311).

Prescribed.			Done.			
	Locality.					
Year. (1)	Coupe No. (2)	Area, acres. (3)	Year. (4)	$\frac{\text{Rab area.}}{\text{Coupe area.}}$ (5)	Cost. RS. (6)	Remarks. (7)

NOTE.—(i) Entries in column (5) should be expressed as a fraction.
(ii) Costs in column (6) will be recorded to the nearest rupee.
(iii) A separate form will be used for each felling series.

FORM XIII.

Control of Fellings in the Bamboo Working Circle.

—————————Felling series.

Prescribed. (1)	Done. Coupe No. (2)	Area, acres. (3)	Year(s) of actual working. (4)	Remarks. (5)
One coupe in each felling series to be worked annually (Working Plan paragraph 341).				

NOTE.—A separate form will be used for each felling series.

FORM XIII (*a*).

Record of yield for the Bamboo Working Circle.

————————Felling series.
Estimated outturn—None estimated.

Year.	Locality worked.		Outturn.		Remarks.
	Coupe No.	Area, acres.	Kind.	Quantity.	
(1)	(2	(3)	(4)		(5)
			Bambusa arundinacea ..	.... *	
			Dendrocalamus strictus ..	.... *	

NOTE.—(i) *Denominations, i.e., cart-loads, head-loads, or culms should be clearly recorded.
(ii) A separate form will be used for each felling series.

FORM XIV.

Control of Working in the Minor Forest Produce Working Circle.

Prescribed.		Done.	
Produce and details of working. (1)	Sale unit. (2)	Year(s) of actual working. (3)	Remarks. (4)
Konnai bark (*Cassia fistula*).—Each range, including unreserves, except those under panchayat management, will be sold in auction in June every fifth year but the period of collection will be only for one year (Working Plan paragraph 356).	Odagathur range. Vellore range. Santavasal range. Polur range. Tiruvannamalai range.		
Avaram (*Cassia auriculata*) *and Sural* (*Ventilago spp.*) *barks.*—Each range including unreserves except those under panchayat management, will ordinarily be sold in auction in June each year. If however there is a demand leases may be for two or even three years (Working Plan paragraph 357).	Odagathur range. Vellore range. Santavasal range. Polur range. Tiruvannamalai range.		
Quarries.—The lease period will not exceed three years (Working Plan paragraph 358).	Santavasal reserve quarry. Banavaram reserve quarry.		
Other produce.—The lease period will be for one year. Farms will ordinarily be sold separately, but two or more may be clubbed together or any particular product, for which a special demand may arise, sold separately (Working Plan paragraph 359).	*Odagathur range*— Ambur farm. Karuthamalai farm. *Vellore range*— Alleri farm (and so on).		
Nuxvomica in the Tiruvannamalai range—Including unreserves except those under panchayat management.	*Tiruvannamalai range*—		

FORM XIV (*a*).

Record of yield for the Minor Forest Produce Working Circle.

Year.	Range.	Yields (for botanical names see paragraph 101).																						
		Per maund of 25 lb.									Per measure.								Cart-load.			lb.		
		Konnai bark.	Avaram bark.	Sural bark.	Nuxvomica.	Tettankottai	Tamarind.	Gallnuts.	Soapnuts.	Pungam.	Kamalpodi.	Tagari.	Serankottai.	Kattamanakku.	Nellikai.	Elandi.	Kalakai.	Sarapappu.	Wood apple.	Kavadi grass.	Quarry stone.	Honey.	Bees wax.	Horns.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
1936-37 ..	Odagathur ..																							
	Vellore ..																							
	Santavasal ..																							
	Polur																							
	Tiruvannamalai.																							
1937-38 ..	Odagathur ..																							

FORM XV (*a*).

Record of yield for the Green Leaf Manure Working Circle.

Prescribed.—Permits will be issued at Rs. 1-4-0 per cart-load for removals from the Vellore and Odagathur ranges and at Rs. 2 per cart-load from the Santavasal, Polur and Tiruvannamalai ranges (Working Plan paragraph 365).

Year. (1)	Range. (2)	Quantity removed, cart-loads. (3)	Remarks. (4)
1936-37 ..	Odagathur		
	Vellore		
	Santavasal		
	Polur		
	Tiruvannamalai		
1937-38 ..	Odagathur		

FORM XVI.

Control of grazing in the Grazing Working Circle.

Year.	Prescriptions.		Done.		
	Closed areas.	Grazing concessions.	Areas actually closed, acres.	Concessions continued.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)
1936-37 ..	(*a*) Banavaram reserve, Ambur and the Seven Palar Plantations, 2,423 acres (Working Plan paragraph 367).	(*a*) Free Grazing (Working Plan paragraphs 374 to 377.)	(*a*) 2,423	(*a*) & (*b*) The concessions were continued.	
	(*b*) Worked fuel coupes, area variable [Working Plan paragraph 370 (iii)].	(*b*) Grazing on payment of half the usual fee (Working Plan paragraph 378).	(*b*) 1,234		
	(*c*) Burnt areas (Working Plan paragraph 379.)		(*c*) Nil.		
1937-38 ..	Do.	Do.			

Record of Works.

1936-37.

——————— Working Circle.

Prescriptions of working plan.		Record of operations carried out.				
Nature of work (with Working Plan paragraph reference numbers).	Locality.	Nature of work.	Locality.	Area, acres.	Cost rupees.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
		(Sample entries for the Sandal Working Circle.)				
		(*a*) *Measures prescribed.*				
1 Creeper cutting at the time of marking wherever necessary (261 and 262.)	One Coupe in each felling series.	Creeper cutting where necessary.	Alleri, C. III ..	891	629	
			Alleri, C. VI ..	845		
			Thongamalai, C. III.	803		
			Thongamalai, C. VI.	786		
			Amerdi, C. III ..	1,405		
			Amerdi, C. VI ..	927		
			Nadanur, C. III ..	445		
			Nadanur, C. VI ..	1,408		
			Veerappanur, C. III	1,020		
			Veerappanur, C. VI.	1,666		
			Komattiyur, C. III.	768		
			Komattiyur, C. VI.	826		
			Patrakad, C. III ..	2,949		
			Patrakad, C. VI ..	1,130		
			Moolakad, C. III ..	1,770		
			Moolakad, C. VI ..	1,926		
			Tiruvannamalai. C. III.	345		
			Tiruvannamalai, C. VI.	216		
Creeper cutting at the time of marking wherever necessary. [260 (*a*)].	57 enclosures exploited annually.	Creeper cutting where necessary.	Vellore range, 10 enclosures.	1,359	Nil done by Malayalees.	
			Santavasal range, 16 enclosures.	2,138		
			Polur range, 31 enclosures.	4,256		
Do. [260 (*b*)].	23 enclosures exploited biennially.	Do.	Santavasal range, 19 enclosures.	5,536		
			Polur range, 4 enclosures.	2,961		
2 Special protection from fire of sandal trees growing in areas where bamboo has flowered and died. Rs. 1,000 to be asked for annually until the risk disappears (266).	....	Special protection from fire of sandal growing in areas where bamboo has flowered and died, Rs. 1,000 provided and Rs. 180 spent on clearing 12 miles of line.	Patrakad, C. III ..	..	180	
3 Measures for prevention of the spread of spike disease (267).	....	100 trees girdled, 400 trees lopped and 20 feet line cleared for 45 chains.	Veerappanur, C.V	..	35	

NOTE.—(i) The areas in column (5) have been extracted from columns (3), (5), (7), etc., of the statement in paragraph (ii) Cost in column (6) will be recorded to the nearest rupee.

Control Journal.

To be written on durable paper and maintained in a loose leaf file. The following headings are suggested as a guide ;—

Sandal Working Circle	1 Reference to important deviations, if necessary, in amplification of entries in the Register of Deviations. 2 Criticism of prescriptions and suggestions for improvement. 3 Exploitation notes and rates. 4 Tending. 5 Spike. 6 Markets and market conditions.
Fuel and Small Timber Working Circle.	1 Reference to important deviations, if necessary, in amplification of entries in the Register of Deviations. 2 Criticism of prescriptions and suggestions for improvement. 3 Size of coupes. 4 Cutting thorny growth at time of felling. 5 Artificial regeneration—height of rab heaps, dates of burning and sowing, choice of species, tending, soil acration, etc. 6 Markets and market conditions.
Bamboo Working Circle ..	1 Reference to important deviations, if necessary, in amplification of entries in the Register of Deviations. 2 Criticism of prescriptions and suggestions for improvement. 3 Flowering. 4 Injuries, e.g., lopping for fodder. 5 Felling rules—extent to which observed. 6 Markets and market conditions.
Minor Forest Produce Working Circle.	1 Reference to important deviations, if necessary, in amplification of entries in the Register of Deviations. 2 Criticism of prescriptions and suggestions for improvement. 3 Departmental working, if undertaken, with reasons for the departure from the usual system of leases. 4 Markets and market conditions.
Green Leaf Manure Working Circle.	1 Reference to important deviations, if necessary, in amplification of entries in the Register of Deviations. 2 Criticism of prescriptions and suggestions for improvement. 3 Rules regulating cutting and removal.
Grazing Working Circle ..	1 Reference to important deviations, if necessary, in amplification of entries in the Register of Deviations. 2 Criticism of prescriptions and suggestions for improvement. 3 Exercise of concessions and withdrawals, if any. 4 Closure of burnt areas. 5 Watering facilities. 6 Grass cutting and fodder supply.
Miscellaneous	1 General protection. 2 Experiments. 3 Roads. 4 Buildings. 5 Wells. 6 Lantana. 7 Boundaries. 8 Fire protection.
Establishment and labour ..	1 Establishment—any change which may be found necessary. 2 Labour—sufficiency or otherwise, wages, etc.
Financia results	To facilitate comparison with working plan forecasts, the financial results will be recorded in the following form. Separate forms will be used for expenditure and revenue and each working circle will be dealt with separately, though not necessarily on a separate form.

Expenditure 1937–38.

Revenue..

Forecast. (1)	Rs. (2)	Actuals. (3)	Rs. (4)	Remarks. (5)
		Sandal Working Circle.		
		Fuel and Small Timber Working Circle.		

The entries in this form will not be so detailed as those in the financial forecast: they will not show interest charges or overheads such as share of "direction," and amounts will be rounded off to the nearest rupee. Columns (1) and (2) have been written up in the blank forms for each year of the working plan period and columns (3) to (4) will be completed by the District Forest Officer. Brief reasons for notable variations should be given in column (5).

Deviation statement.

Working Plan for the Vellore East Division.

Year.

Serial number of deviation.	Control Form No, and page.	Reference to Working Plan.		Nature of deviation.	Remarks.
		Paragraph.	Prescription.		
(1)	(2)	(3)	(4)	(5)	(6)

Proceedings of the Chief Conservator of Forests

Proceedings No. 211, Press, 13th April 1938

Working Plan—Vellore East Division—Sanctioned.

C. C. WILSON, Esq., I.F.S.,
Chief Conservator of Forests.

READ—the following paper :—

Letter from the Conservator of Forests, Working Plans Circle, dated 14th May 1937, No. A. 664/33.

Proceedings—No. 211, Press, dated 13th April 1938.

Sanctioned.

C. C. WILSON,
Chief Conservator of Forests.

(True copy)

Personal Assistant.

To the Conservator of Forests, Working Plans Circle.
„ Conservator of Forests, Salem Circle.
„ District Forest Officer, Vellore East.
„ Collector of North Arcot.

Copy to other Conservators, District Forest Officers, Principal, Forest College, Provincial Silviculturist, Working Plan Officers, President, Forest Research Institute and College, Dehra Dun.

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